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Huge Rhine Hydro-Electric Project nears Completion

French Contractors Ahead of Scheduled Program—Ten Million Yards of Excavation

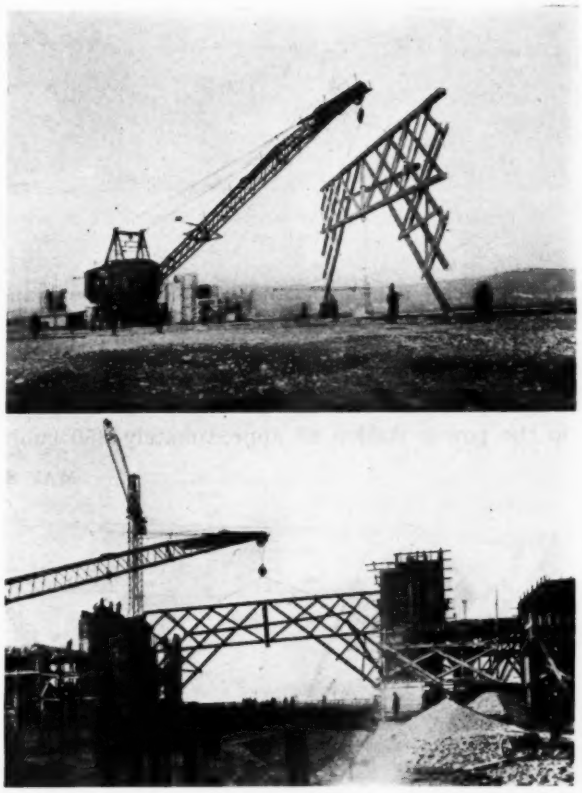
IN OUR ISSUE of *June, 1929,* we described the work of the Societe Energie Electrique du Rhin, in connection with the construction of France's huge new generating station situated between Bale and Strasbourg.

This project, which involves changing the course of that historic river and the construction of a big power station and huge canal locks is now nearing completion. The excavation amounted to about ten million cubic yards and has been completed in less than three years.

Thanks to the record time in which this excavation work was finished, the whole contract is expected to be finished well ahead of the scheduled program.

For many years past the possibility of utilizing the energy of the Rhine for generating electricity had been under consideration. Between the point where this great river enters France, just below Bale, and Strasbourg, the capital of Alsace, there is a drop in level of more than 330 feet, and this head with the enormous volume of water is sufficient to develop 900,000 horsepower. Had it not been for the World War, there is no doubt that this hydro-electric project would have been undertaken at an earlier date. Eventually, however, the concession for the construction and development of this electrification was granted by the French Government on July 28, 1927.

As shown on the accompanying map, the work consisted of the excavation of a main canal to divert the Rhine from its course and lead it to the generating station, and thence by a discharge canal back into the river at a point some four miles further down. Just before reaching the power station this main canal branches into two parts, one of which is the power canal proper, and



Lifting a form 80 feet wide and weighing 10 tons. Five minutes later the form is in position.

the other is a navigation canal, which, through a system of locks, joins the discharge canal and thence back to the Rhine.

Dykes carry canal 22 feet above ground surface

The barrage across the Rhine backs up the water and diverts it along the canal where it is carried at a level of approximately 22 feet above the natural surface of the ground. To carry it huge dykes, lined with concrete on their inner sides, were built while the bottom of the canal was made watertight with clay. Any water, which, in spite of these precautions, may eventually filter through the dykes, will drain back into the Rhine on that side, and on the opposite side will be taken care of

Concreting the side slopes of the power canal with a special machine.

by the small drainage canal shown on the plan, which parallels the main canal. This main canal has a bottom width of 80 metres (264 feet), inside slopes 3:1, and maximum depth of excavation about 25 feet. It will carry a volume of water to the power station of approximately 850 cubic metres (30,000 cubic feet) per second, and the average speed of flow will be 70 cubic metres (2¼ feet) per second.

To Chief Engineer Charles Moreau much credit is due

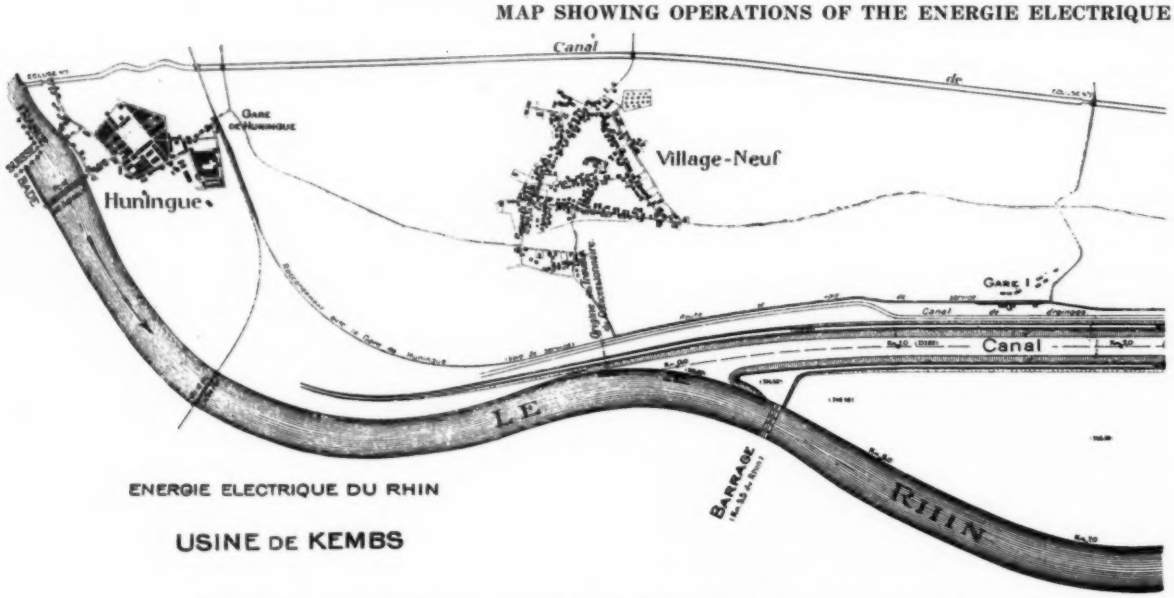
The excavating was handled by a group of important French contractors under the competant supervision of well known Chief Engineer Charles Moreau. Monsieur Moreau has been associated with many famous projects in the past and the excellent progress and well coordinated organization of this great work on the Rhine is largely due to his outstanding ability and experience.

In all something like sixteen excavating machines of various types and sizes were used on the job. Deserving of special mention, owing to their excellent performance, were four Bucyrus-Erie

Loading cars with the big dragline becomes a simple matter with the assistance of this 50-yard hopper.

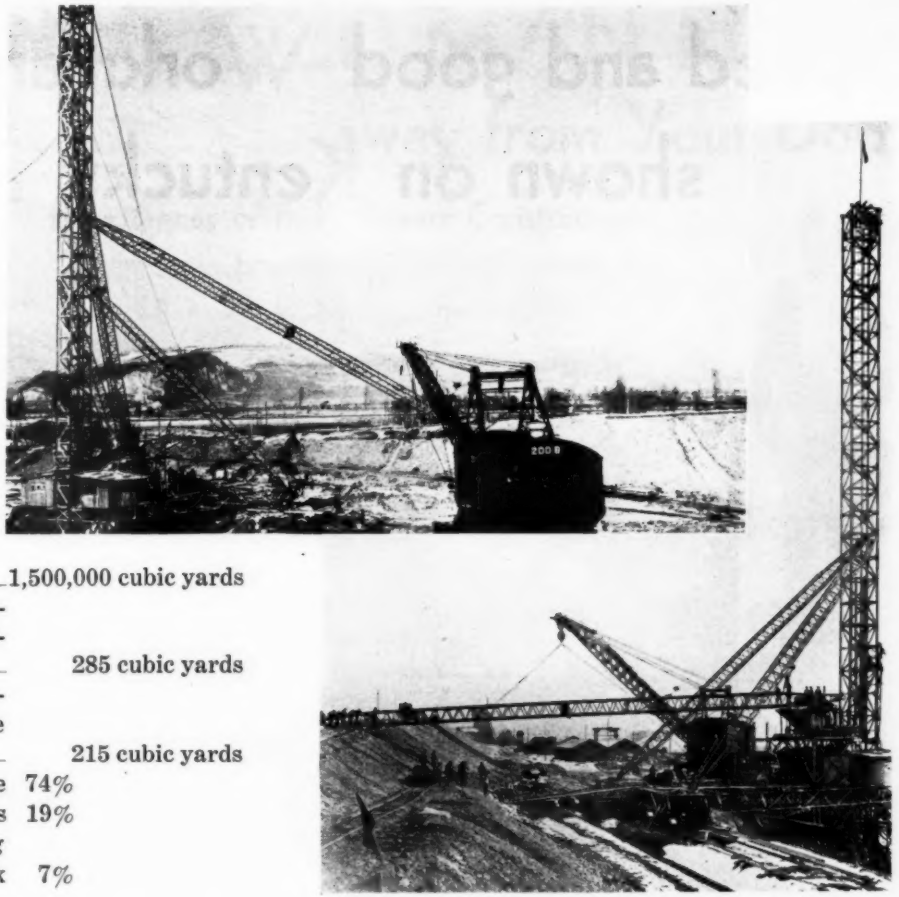
machines, two 50-B 2-yard steam shovels and two Class 200 draglines.

MAP SHOWING OPERATIONS OF THE ENERGIE ELECTRIQUE



Translation of French Captions on map: Canal d' Amenée, Power Canal; Ecluses, Locks; Canal de Fuite,

The latter were caterpillar mounted units, with 137-foot boom and four and five cubic yard drag buckets, electrically operated with Ward-Leonard control, the machines being operated off 6,000 volt current. These huge draglines, which are believed to be the only machines of their type operated in Europe, have rendered remarkable services. The following figures represent the results given by one of them:



Dismantling the concrete distributing tower was one of the utility jobs where the Class 200 came in handy.

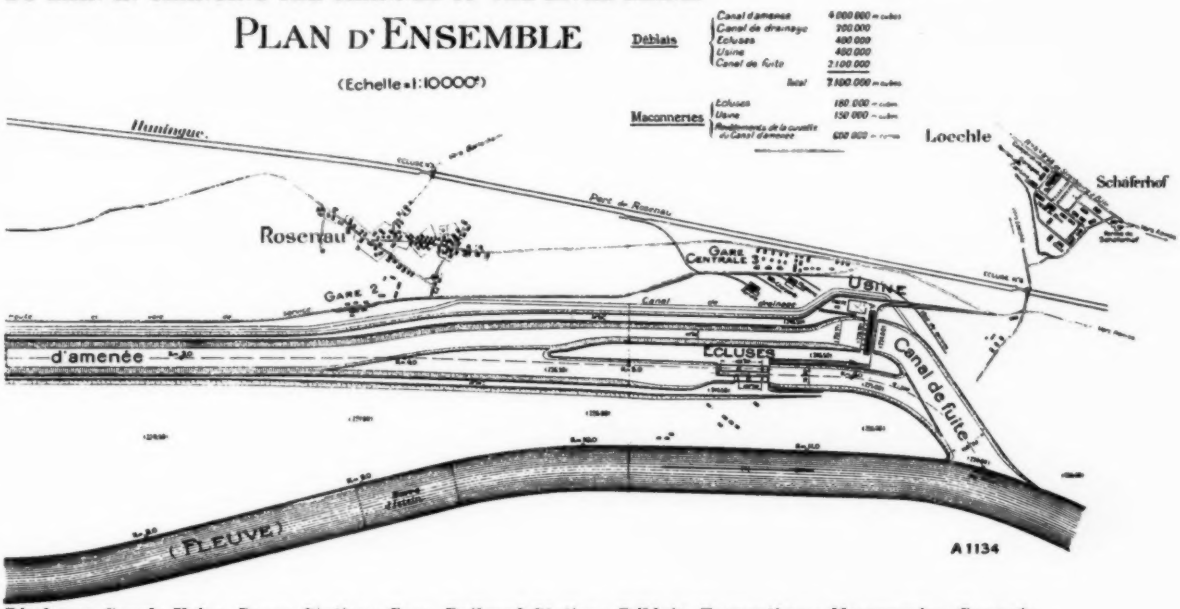
Total excavation	1,500,000 cubic yards
Average hourly output, actual digging time	285 cubic yards
Average hourly output, all idle time counted in	215 cubic yards
Net operating time	74%
Miscellaneous delays	19%
Delays for carrying out repair work	7%

50-B steamer averages 194 yards an hour through four consecutive months

The 50-B steam shovels also gave good results, the output of one of these machines over a sustained period of four working months averaged 194 cubic yards per hour, which is thought to be

(Continued on Page 114)

DU RHIN IN CHANGING THE CHANNEL OF THE RIVER RHINE.



Discharge Canal; Usine, Power Station; Gare, Railroad Station; Déblais, Excavations; Maçonneries, Concrete.

Speed and good Workmanship shown on Kentucky Road Job

Did you ever see a prettier grade?

Jenkins Construction Company finishes contract three and one-half months ahead of time limit.

THE Jenkins Construction Company of Elizabethtown, Kentucky, composed of Neff Jenkins and his son, Ray Jenkins, well-known Kentucky contractors, finished 12.1 miles of road in Barren County, Kentucky, Project No. 210 BG, consisting of 150,000 cubic yards of rock and dirt excavation, also 1700 cubic yards of concrete for bridge and culverts.

They received work order on April 2nd and shovels cut out September 19th, and on October 3rd the road was accepted by the State Highway Department. The time limit was not up until January 12th, 1932.

Excellent grade carried by shovels

This job was considered by the engineers as one of the best grade and drain jobs in the state of Kentucky. To give you an idea of the way the Jenkins Construction Company do grade and drain work, during the whole life of this job, they carried such an excellent grade that a car could make fifty miles per hour over it before it was finally dressed.

Equipment used was one Bucyrus-Erie Type "B-2" steamer, and one Bucyrus-Erie 1030 gas shovel, with Dell Phillips on the steamer and Bill Edlen on the gas, working only one ten-hour shift per day.

Iron Mules and trucks haul the dirt

Hauling equipment consisted of four Hughes-Keenan Iron Mules, and one Mack and three Dodge dump trucks. Other equipment on the job was one 9x8 Ingersoll-Rand Type "20" compressor and "S-49" Ingersoll-Rand Jackhamers for drilling; also one 4¼x4 Type "20" Ingersoll-Rand compressor operating a No. 34 Ingersoll-Rand sharpener, forge and blacksmith shop. Final grading was done with a No. 12 Adams grader and Caterpillar "60" tractor.

All work was under direct supervision of Ray Jenkins. W. M. Greathouse was Resident Engineer on the job; J. A. "Pete" Reed, District Engineer; and J. C. Jolly of Bowling Green, Assistant Engineer.

Hotel accommodations were nil, and she accosted the constable as to a possible boarding house.

That worthy replied, "Wall, there hain't any, unless you sleep with the station agent."

"Sir," indignantly exclaimed the young teacher, "I'll have you understand that I'm a lady."

"So is the station agent," drawled the constable.

"That reminds me," said the man who watched the steam shovel at work, "I'm to play golf tomorrow afternoon."

President E. F. Powers

Keeping OLD MAN RIVER away from Your Door

Experiences of E. F. Powers Construction Company in placing 7,200,000 yards in 18 miles of Mississippi levees

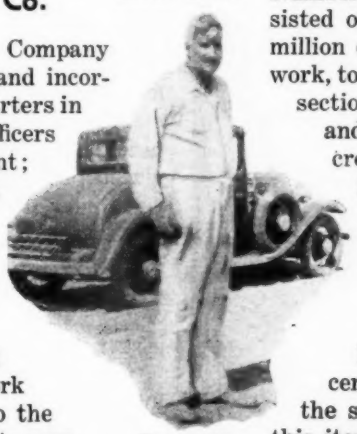
Chas. M. Powers

Author Davis

By Maxwell E. Davis, Engineer, E. F. Powers Construction Co.

THE E. F. Powers Construction Company was organized in March, 1926, and incorporated in Florida, with headquarters in West Palm Beach. The following officers were named: E. F. Powers, President; E. M. Archibald, Vice President; A. L. Noble, Treasurer, and W. E. Keen, Secretary.

All officers having had considerable experience in construction work, little time was lost in getting started. This company engaged in highway, bridge and drainage work from the time of its organization to the present writing. Some of the projects completed are, the concrete bridge across Miami river at S. E. Second Avenue in Miami, 75 miles of drainage canal including 9 pump stations with a capacity of 180,000 gallons per minute each, and a number of highway projects. These contracts were completed well ahead of scheduled time, and to the complete satisfaction of those concerned.



Treasurer A. L. Noble

Supt. Roy Shaw

First river job 2,000,000 yards

The organization grew to a position where they could expand and handle larger jobs, so, in July, 1929, bids were submitted at the United States Engineers Office, Vicksburg, Mississippi, on four levee projects on the Mississippi river, totaling six million cubic yards of earth work. These bids were entered separately. All four were low, and the company was given the opportunity of accepting all or any of them, of which one was accepted, namely, Below Gunnison Item Number Four. This item consisted of approximately two million cubic yards of earth work, to be placed in a typical section 23 feet net height and with a ten-foot crown and net slopes of 6½ to one landside and 3½ to one riverside. The amount of shrinkage varies with the type of equipment with which it is placed, namely hauling equipment 15%, and dragline 25%. The shrinkage is based on the net height at center and added to the center fill, toeing out at the net toes of the section. The specified time limit for this item was one thousand calendar days, which made the limiting month of completion July, 1932.

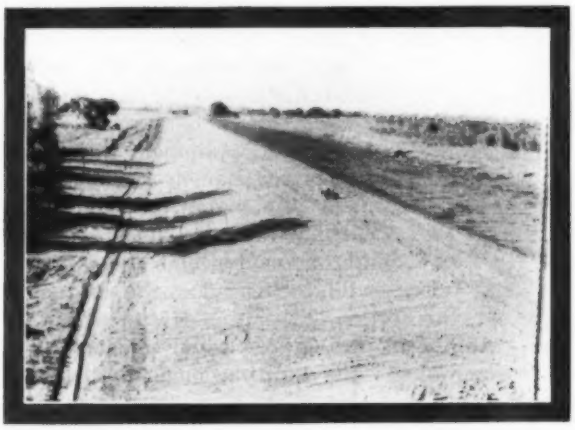
To do this work, three Caterpillar Sixty tractors, six crawler-type dump wagons of seven-yard capacity, and one Northwest dragline of one and one-half yard capacity were placed on the job in October, 1929. The Caterpillar tractors handled the two

Tower Operator Bob Cates and his crew. Each tower operates three shifts of 8 hours per day.

The caterpillar mountings under the towers are rugged units that move easily over most any going.

Enlarging an old levee. The head tower is 130 feet high, the tail tower 50 feet. The machine is electrically operated except that the tail tower is moved by power from a Wisconsin gasoline motor. The electric power is carried in a temporary line down the proposed levee with available connections for the armored cable every 2000 feet through oil circuit breakers.

(each) dump wagons very efficiently, and the dragline more than filled the bill as a loading unit, but as seen on the accompanying progress curve, the progress was unsatisfactory. When the traditional "High Water" came in January, 1930, there was approximately fifty thousand cubic yards in place, an average of about twenty-thousand cubic yards per month. This, of course, kept the progress below the dead line.



Behind the tower the levee is finished smoothly and to accurate grade. E. F. Powers Construction Company increases the output of their tower by using a tractor and blade to dress the levee after the tower has placed the dirt.

Tower excavator purchased to secure required production

In the meantime, realizing the deficiency and faced with the problem of obtaining equipment of a greater production capacity, the engineers of the Bucyrus-Erie Company were consulted. This resulted in the placing of an order for a straight electric tower excavator, of twelve-cubic-yard capacity. The order was placed in November, 1929.

The new Powers tower excavator has a tail tower 50 feet in height. Sheaves may be moved to the top for operating long spans. The arm leaning out from the base is a depression link holding the track cable tight and low to facilitate gravity return of the bucket. The two sheaves behind the depression link are for a back haul line which is used when the towers work on extreme spans.

The high water receded and work was resumed May 15th, 1930, with the hauling unit. The tower was being erected at this time, and things were looking much brighter for the company. The tower started digging June 7th, 1930, and, even with the necessary delays for adjustments, etc., the tower placed one-hundred-fifty-thousand cubic yards the remainder of the month. From then on the progress curve speaks for itself. From an official statement published by the United States Engineers Office, Vicksburg, Mississippi, we quote:

"The E. F. Powers Construction Company is constructing the Below Gunnison levee with one Bucyrus-Erie electric tower excavator, and one tractor and wagon outfit and will probably place the largest amount of yardage for the season of any contractor in this area.

"The Bucyrus-Erie electric tower excavator, using a 10-yard Bucyrus-Erie semi-bottomless bucket, has placed 1,056,497 cubic yards in 3,950 hours of which working time was 3,308 hours, lost time, 642 hours (a percentage of 16.25%) an average of 319 yards per hour worked. A total of about 134,550 trips with the 10-yard bucket, averaging 7.9 cubic

Camp on the west bank.

yards per trip. The average time consumed by each trip was about one minute twenty seconds, the average haul was about 375 feet.

"The hauling outfit consists of one Northwest 1½-yard dragline, five 60 H. P. Caterpillar tractors, six 5-yard Western wagons and two 8-yard Smith wagons, and has moved 362,220 cubic yards in 3,810 hours of which working time was 3,534 hours, lost time 276 hours (a percentage of 7.24%) an average of 25.62 yards per hauling unit, per hour, worked. The average haul was about 375 feet."

The preceding paragraphs, which were published by the Government engineers, will give the readers an idea of the excellent performance of both units on the Below Gunnison contract. The contract was completed January 26, 1931, just 17 months ahead of schedule.

Bid on eight items . . . low on eight items

Then came the usual minor repairs, and the old familiar problem of getting more work. Of course there is plenty of levee work going on and large

With a dry season it's easy digging and the draglines pile the Westerns high.

contracts are being let at frequent intervals, but the competition was as great in proportion as the number of contracts, several other contractors having purchased tower excavators by this time. Nevertheless bids were submitted at the United States Engineers Office, Vicksburg, Mississippi, June 10, 1931, on eight items, six of which were on the west bank in Arkansas, the remaining two on the east bank in Mississippi. The company was fortunate enough to be low bidders on all eight items totaling five million two hundred thousand cubic yards of earth work, to be placed in a typical section of the same dimensions described earlier in this article. The time limit set for the two items on the east bank, totaling 1,300,000 cubic yards, was 185 calendar days, making the limiting date December 31, 1931. The time limit placed on the six items on the west bank, totaling 3,500,000 cubic yards, was 365 calendar days which makes the limiting date of completion June 23, 1932.

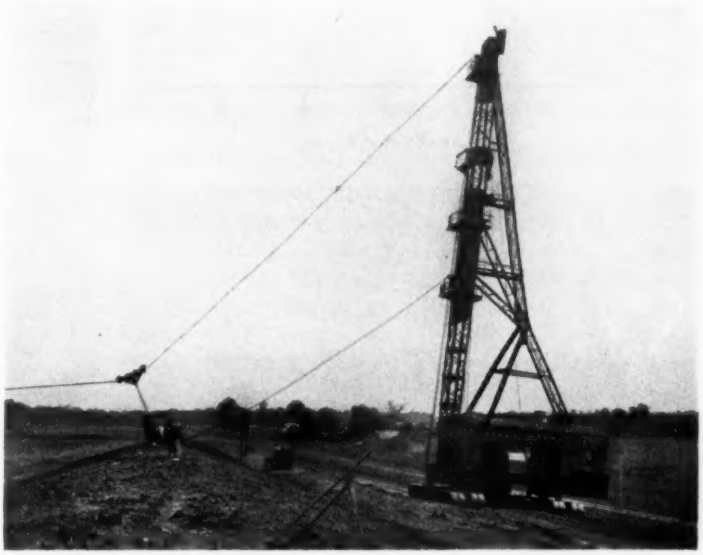
To complete this work within the specified time, more equipment and increased forces were required. The problem was solved by the purchase of another Bucyrus-Erie tower excavator, five new Caterpillar

This Euclid bulldozer mounted on a Caterpillar tractor does the rough dressing as well as "other things one would think could not be done with it or anything else."

Sixty tractors, eight Western, crawler-type, automatic-wind-dump wagons of 6-yard capacity, and two Northwest draglines of 1½-yard capacity. This equipment was placed on the west bank.

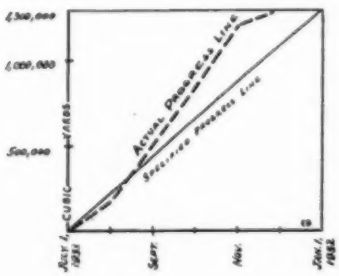
Draglines and wagons place footing for tower

John W. Stansell, Superintendent in charge of the two items on the east bank, has learned through long experience with the different methods of construction, that a hauling unit placing about a ten-foot lift in the back of a levee base of a width sufficient to track the tower excavator on, or approxi-



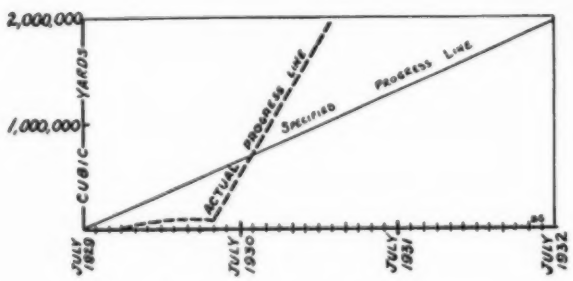
With the head tower running on the old levee on this section, the height of the tall mast is still further increased, speeding up the return of the bucket to the borrow pit. These Bucyrus-Erie machines carry their track cable 130 feet above the footing and can operate on very wide spans, frequently working at 750 feet or more.

mately 100 feet wide, works very effectively in conjunction with the tower machine. The hauling unit takes the dirt from the extreme back of the borrow pits, thus providing drainage for the remainder of the dirt in the pit section, and increasing the production of the tower excavator, by placing it 10 feet higher than the natural ground, which raises the limit of the gravity return of the bucket, and the height at which it can dump.

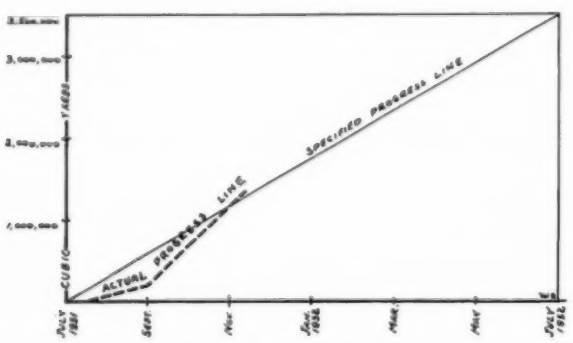


East Bank—Two Items

Mr. Stansell has very ably handled the portion of the work on the east bank and by the time this article reaches the press will have completed the two items under his supervision. The accompanying progress curve will give the readers an idea of the fine progress Mr. Stansell has made. His equipment on the east bank includes one Bucyrus-Erie electric tower excavator with 12-yard bucket, six Caterpillar "60" tractors, twelve crawler-type dump wagons of six and seven-yards capacity and two Northwest draglines of 1½ yards capacity. The latter have been used for loading wagons and dressing the back slope of the levee. Mr. Stansell has alternated between the Sauerman bottomless and the Bucyrus-Erie quarter-bottom types of buckets as the material warranted.



Below Gunnison—Item No. 4



West Bank—Six Items

In places there was pretty much of a jungle to be cleared away.

Tower places as high as 12,000 yards in single day

Roy Shaw, superintendent of the six items on the west bank, has also shown unusual progress with the following equipment: one Bucyrus-Erie electric tower excavator, two Caterpillar "60" tractors, four Western crawler-type, automatic-wind-dump wagons of 6-yard capacity and one Northwest dragline

(Continued on Page 85)

General view of operation of the older tower. Note the wide borrow pit from which the machine obtains material for the levee.

Excavating in Argentina

Highway data of this sort is being collected for all countries by the U. S. Department of Commerce, and will appear in subsequent issues of The Excavating Engineer.

ARGENTINA, on January 1, 1931, had an estimated 2,597 miles of hard surfaced roads, including waterbound macadam highways. There were also estimated to be 44,580 miles of unsurfaced but drained and graded roads, and in addition from 90,000 to 100,000 miles of natural earth roads and trails passable in the dry season. Paved city streets are general, those in the Capital (Buenos Aires) totaling 15,292,442 square meters in 1931, and those in six other important cities making an additional 7,250,000 square meters. New street paving done in the province of Buenos Aires during 1930 was given as 8,210,000 square meters, with total previously paved about 22,000,000 square meters. There were an estimated 366,324 motor vehicles in circulation in 1931, divided into 68,760 trucks, 2,800 busses, and 294,764 passenger cars.

Contractor Dwight P. Robinson y Cia of Argentina excavated for the La Croze Subway in Buenos Aires. As shown in the picture the Bucyrus-Erie Gas+Air excavated the material and the P. & H. clamshell took it out of the trench and loaded it. The La Croze Subway is by no means the first in Buenos Aires, the first having been built some twenty years ago and placed in operation in 1910. Additional subways are planned to handle the city's fast growing population. The material being excavated in the picture is hardpan (locally called "tosca"). It was dug without preliminary blasting. The clamshells loaded to trucks and at times it was necessary to use two clamshells to move the output of one shovel in the trench. Work was carried on twenty-four hours of the day, seven days a week.

Near Azul these Bucyrus-Erie E-2 shovels and draglines are working in connection with the operation of Ferrocarril-Sud (Argentine Southern Railway) on an extension of the Company's large system. On the portion of the work where this picture was made, the dragline excavated a portion of the cut in advance of the shovel and deposited the material far enough away to permit the shovel to spoil directly onto the bank. On other portions of the work some of the material excavated by the shovel is rehandled by the dragline. These machines are equipped with Atlas Diesel Engines. The small volume of cheap fuel oil required by the machines is of special advantage in reducing costs of supplying the machines.

Area Almost Half Land Area of United States

The area of the country is 1,153,417 square miles and the population was estimated in 1930 at 11,470,908, of which 40 per cent was rural and 60 per cent urban. The population (1929) of some cities follows: Buenos Aires, the capital, 2,163,519, Rosario 461,678; Cordobe 228,000; La Plata 169,678; Santa Fe 121,248; and Tucuman 166,219. The leading industries are agriculture and manufacturing.

There is a Federal Highway Bureau which does a large part of the planning and construction of highway projects in the 14 provinces, and all the work in the 10 territories. In addition, road con-

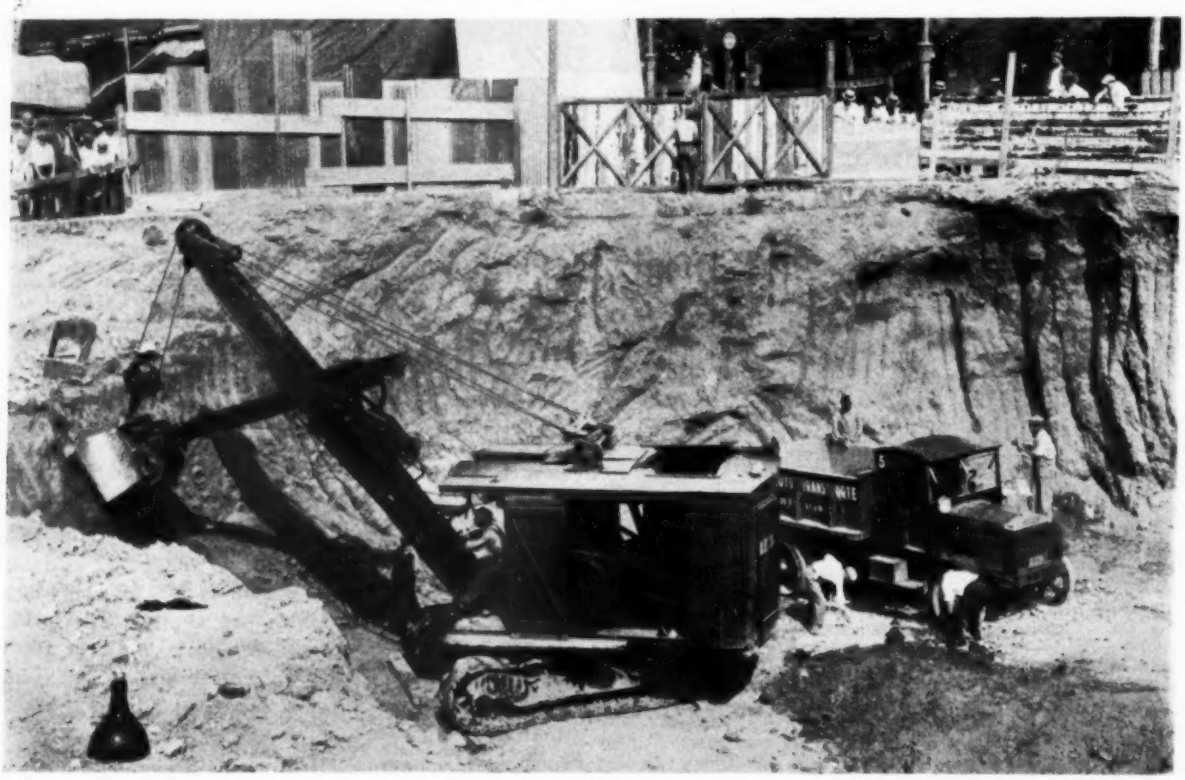
Here is another picture of the work on the extension of the Argentine Southern Railroad near Azul in which two of the Bucyrus-Erie 1¼-yard draglines are building a fill from material borrowed directly alongside the right-of-way. This Company have used 5 Bucyrus-Erie Diesels on their construction projects.

struction and repairs are also done by provincial and and municipal authorities. The bulk of actual construction work is let out by bids to private contractors. During 1928, 1929, and 1930, expenditures by the Federal Government were in excess of $5,000,000 U. S. currency per annum. In 1931 this was almost doubled by funds from a surcharge on gasoline. Incomplete data on provincial expenditures for the year 1930 indicate an amount in the neighborhood of $6,000,000 U. S. currency. Funds are obtainable by the gas surcharge of approximately $0.03 (U. S.) a gallon (except in the province of Buenos Aires where this amounts to about $0.046 per gallon); the proceeds of a tax of 3 per cent on the gross earnings of the railroads imposed by the Mitre Law; appropriations from the general revenues of Congress and of the different provinces, and by bond issues.

Labor is plentiful. In 1929 the average wage for unskilled laborers was $2.67 U. S. currency per day. The deposits of rock, gravel and sand for concrete are distant from the most thickly populated areas, so that materials for surfaced roads must be brought from a distance, at consequent high cost. Dirt roads, however, passable in dry weather, can be constructed from the clay and sandy earth which abounds in most sections. Local cement production has been increasing steadily, and amounted to 375,717 tons in 1930, as compared with imports of 419,829 tons in the same year. Sand and stone are imported, mostly from Uruguay, the quantities in 1930 being 2,355 tons of sand, 86,786 tons of paving stone, and 383,822 tons of gravel.

American Equipment Preferred

There is a preference for American machinery and equipment, including maintenance equipment, concrete mixers, rollers, scarifiers, drags, planers, scrapers, graders and tractors. During the five year period 1926 to 1930, inclusive, shipments from the United States to Argentina of these articles for all



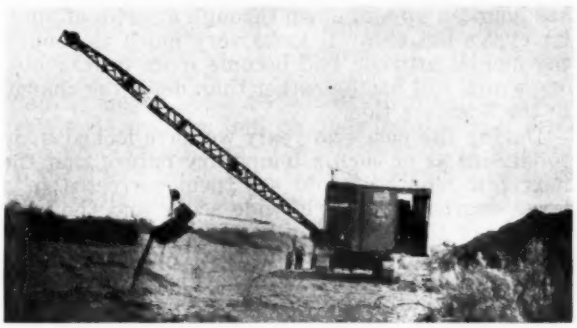
In excavating for the foundation of the new Mercado de Abastos at Buenos Aires (Municipal General Market at Buenos Aires) Cia. Argentina Cimento Armado loaded to trucks with their Bucyrus-Erie Gas+Air. The shovel averaged over 100 trucks per day of ten hours. Various sizes of trucks were used, from five to seven ton and carrying seven to ten dippers full per load. When the swing was 90° or less, the Gas+Air easily filled one of the large trucks in 2½ minutes.

purposes were as follows: 1926, $2,120,000; 1927, $3,184,000; 1928, $5,400,000; 1929, $9,744,000; 1930, $5,702,000, or an annual average during the period of $5,230,000.

American contractors have undertaken highway construction work in Argentina, mostly city streets and some local roads in the provinces, and they are closely watching developments in the road program.

One Mile Railroad per 468 Population

Argentina had a railway mileage of 24,533 miles in 1930. These railways carried 36,595,000 metric tons of freights (2,200 pounds per ton), and 161,660,390 passengers in 1930. There are many miles of inland waterways, and Argentina has a merchant marine of 389 vessels, engaged in river coastwise trade, with a gross tonnage of 322,671 tons. In 1930 a total of 2,557 vessels engaged in foreign trade, with a capacity of 9,887,000 tons, entered her ports.



Excavating for a canal near Rio Negro for Direccion General de Irrigacion (Argentina Government Department of Irrigation) with a half-yard gasoline dragline.

Credito Ferrocarrilero Inmobiliario, important Argentine railroad contracting company uses a Bucyrus-Erie E-2 dragline with Atlas Diesel Engines in building "terraplen" for extension of the Argentine Railroad through the Province of Formosa. This extension will run from Las Lomitas to Embarcación, forming an important connection in the rapidly growing Argentine system. A grade is being built through real frontier country, practically unsettled, but with great agricultural, grazing and forestry potentialities. Formosa is subtropical. The excavating work is carried on under adverse conditions of sand, dust, high temperature, and worst of all, some six days from the nearest source of ordinary supplies and materials. The owners report that these E-2 Diesels proved themselves reliable under these difficult conditions.

The climate varies from tropical in the north to frigid in the extreme south. The average temperature for the central portion is 63° F.

Information for this article is prepared by Thomas C. Ballagh, Automotive Trade Commissioner, Buenos Aires, Argentina, and is furnished through the courtesy of The Foreign Construction Division of the U. S. Bureau of Commerce.

Laying 760 Tons of Concrete Pipe

ON ROUTE 25, Section 15, between Newark Air Port and Elizabeth, New Jersey, one of our cameramen snapped an interesting culvert job being put in by H. K. Harrison & Son, Inc., of Newark. There were 80 sections of pipe being laid, each section weighing 9½ tons.

The contract called for a four-line culvert across the highway in a trench about 40 feet wide and 18 feet deep. It was necessary to do one-half the roadway at a time in order to maintain traffic on the other half. Each pipe was 6 feet long and 91 inches x 91 inches inside dimensions and weighed 9½ tons. It required 80 of these to complete the culvert. There were 360 45 to 50-foot piles driven for a support for the pipe and capped with 12 x 12 long leaf yellow pine. Cracked stone was filled between the caps.

Two machines were used part of the time. A 30-B Bucyrus-Erie operated by William Kolek laid all the pipe and drove most of the piles with a 9-B McKiernan-Terry pile hammer. A 20-B Bucyrus-Erie operated by Sam Dellar was used on the excavation and timbering.

Clamshell and crane team up closely in excavating and laying 9½-ton culvert sections.

The pipe was made by the Massey Concrete Products Company at their Newark plant, and was delivered by their own truck and trailer, hauling 3 pipe to each load.

The foreman in charge for H. L. Harrison & Son was Louis Delia. Time taken to complete the contract was three months.

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FOUNDED 1905

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The Business Situation

THERE is little one can find in those business statistics for December and January available at this writing to indicate a definite turn toward improved conditions. Yet all over the country there is a very definite change in attitude which cannot help but react favorably on business conditions.

The feeling seems to have changed from one of waiting to one of doing. Few of us can afford to sit back and wait longer for the rosy days of 1929 to come again. If conditions will not adapt themselves to our liking we must adapt ourselves to conditions. And so the fighters are stepping back in to the ring to meet 1932 conditions as they are.

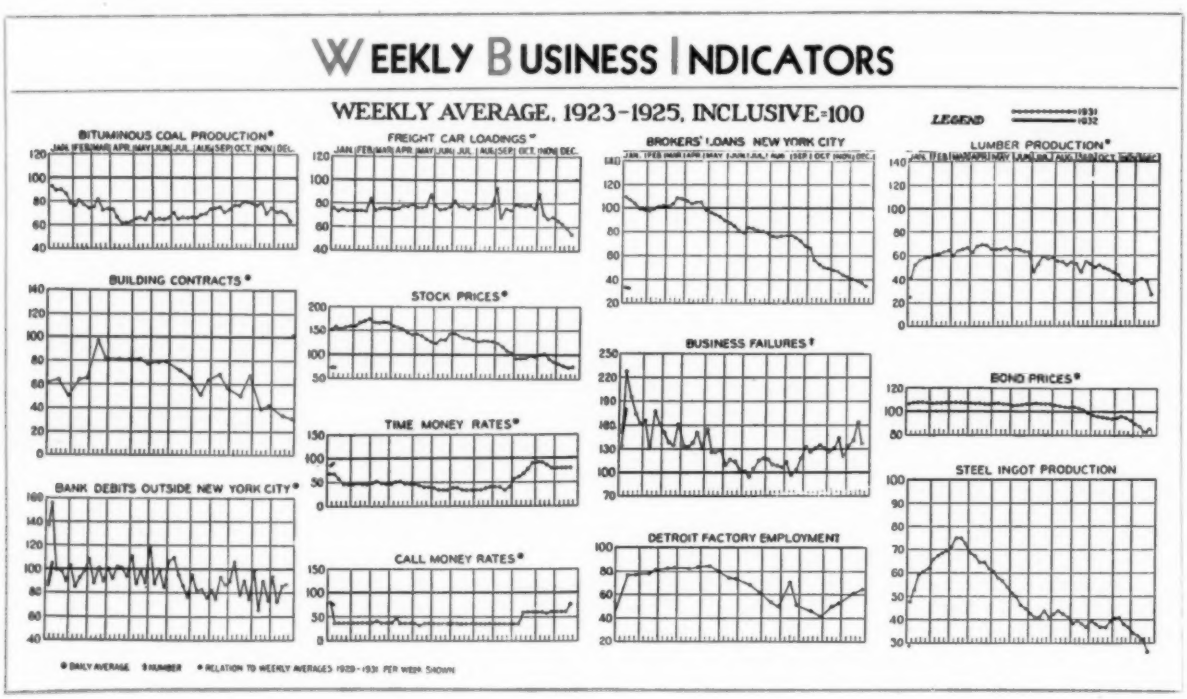
President Hoover has appealed on Congress to enact legislation designed to break the vicious spirals of deflation. The program includes eight projects: strengthening of the land bank; creation of the Reconstruction Finance Corporation; enlargement of Federal Reserve Bank powers; early distributions to depositors in closed banks; revision of laws to help railroads; revision of bank laws to safeguard depositors; economy in federal expenditures.

More important still, business men with red blood in their veins are reorganizing, modernizing their products and plants so that they can earn profits under existing circumstances.

We have been through a series of periods, in each of which business has fallen off still farther and between each of which business has shown some improvement. For example, the bear market we have witnessed for the past two years on the New York Stock Exchange has been through six such cycles. The mental attitude of business men has bounced up and down through a series of similar cycles but today it looks very much as though the mental attitude had become more courageous, one which will hasten rather than defer the change in the business tide.

During the past two years we have looked upon conditions as of such a temporary nature that the next few months would see them corrected in a large degree. The world-wide scope and the seriousness of the depression has forced economists to change this view. That the rise from present inactivity to more satisfactory business volume will be gradual, is the present most generally accepted view. Accordingly individuals are adjusting their affairs to the new order of things. That this adjustment is in progress is seen by the way in which the country met the strain of the drop in business which followed the increased activity during November last. While that drop was more severe in proportion than the drop in October 1929, it was met with no such panic of fear or clamor for currency as occurred a few months previous.

While the record of business during the past month has not been such as to beget optimism, there are a number of bright spots in the picture. Many readjustments have been made during the past few months, some of which were delayed for



long periods in hope that they might not be necessary, but which, now that they have been accomplished, promise to help business improvement in the near future.

Construction expectations for the first quarter of 1932 are summed up by L. Seth Schnitman, chief statistician, *F. W. Dodge Corporation*, in the current General Building Contractor. These strikingly point to the fact that, although this balance wheel of American industry turns more slowly, it is still turning.

A total of $850,000,000 is estimated as a maximum construction volume for the quarter.

"$850,000,000 is an investment of considerable size for any country whose appetite is not already sated with billions," Mr. Schnitman said in an interview concerning the forecast. "It represents about $275,000,000 in wages for building tradesmen. It means about $350,000,000 in building materials. Despite an outlook showing losses of sizeable proportions from the corresponding quarter of 1931, this projected building progam still gives work to hundreds of thousands of men."

Reviewing construction activities *F. W. Dodge Corporation* finds that the 1931 total for all types of construction in the 37 states east of the Rockies amounted to $3,092,849,500 in actual contracts awarded in that area.

The year's final quarter produced a contract total of $530,141,700 for all classes of construction in these 37 states. Of this amount December accounted for $136,851,600 or 26 per cent of the total for the quarter. Contract awards in the final quarter of 1930 aggregated $839,715,600.

Looking again to the future we realize that there'll not be many more people in the country in 1932 than in 1931 . . . nor much more money to spend. But there are opportunities for those who have courage to look for them and profits for those who have the vision and the will to make them.

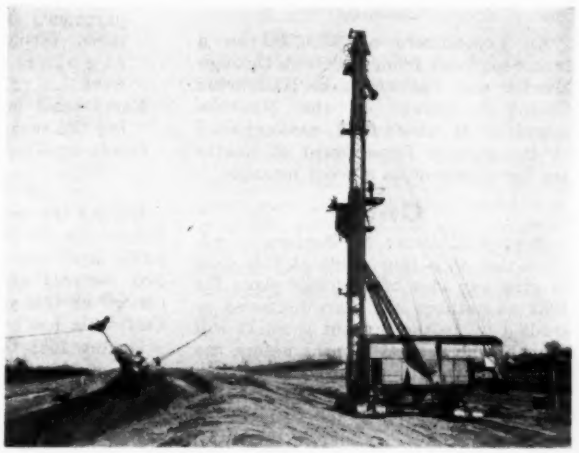
Lloyd Barrage Opened at Sukkur India

IN *November, 1929* a very complete article was published in *The Excavating Engineer* describing the construction of Sukkur Barrage and the great network of canals which lead the water of the Indus from this mammoth dam in northwest India over a rainless desert of 6,500,000 acres, an area as big as Massachusetts, Rhode Island and Delaware put together. Recently Viceroy Lord Willingdon took time off from his trouble with Gandhi and his followers for the opening ceremony of the great dam at Sukkur which is known as Lloyd Barrage. From a platform glittering with native princes and staff officers, he threw the switch that opened the flood gates of the biggest irrigation project in the world to the network of canals over 6,000 miles long. On these and on the two dams which make up the project 77,000 men have been employed for nine years and there is still considerable digging to be done in completing the great canal system. The project is reported to have cost $75,000,000 and will provide farm work for 2,500,000 people.

Many famous records were made by the Bucyrus-Erie and Ruston-Bucyrus draglines which carried the great gigantic spider web of canals across the sun-beaten, dust blown Sind. In a grim Mohammedan proverb is a vivid description of Sind in summer "Why should Allah make hell, has He not already made Jacobabad and Sukkur?" It is this country that engineering brains, courageous men and modern machinery is changing to what will be one of the largest and most fertile agricultural sections in the world. Chief Engineer C. S. C. Harrison, who has been in charge since the conception of the scheme, deserves the highest possible credit for the excellent progress of the work which has been underway since 1924. Immediately after the ceremony of opening the gates of Lloyd Barrage, Lord Willingdon announced that a knighthood had been awarded to Mr. Harrison.

Keeping Old Man River from Your Door

(Continued from Page 80)



This is the first of E. F. Powers Construction Company's tower excavators. For comparison of size note the crawler wagon standing at the rear of the machine.

of 1½-yard capacity. Mr. Shaw is using a Euclid bulldozer for rough dressing as well as a number of other things that one would think could not be done with it or anything else. The bulldozer has proved a useful tool in this type of construction. The new tower excavator, under Mr. Shaw's supervision, has reached a peak of twelve-thousand cubic yards in a single day.

A late start was made on the west bank due to the erecting of new equipment, etc. However, the progress is now of a satisfactory status, and the job will be completed well ahead of time with the equipment, now employed, and some additional equipment about to be placed.

Both Mr. Stansell and Mr. Shaw have made record estimates and kept their operation costs well below the average, both showing near record runs, with track and drag cables. Neither have had any major breakdowns, and the Mississippi and Arkansas Power Companies are to be commended on their efficient service in maintaining ample power at all times.

The E. F. Powers Construction Company soon will have completed eight miles, totaling seven million, two hundred thousand cubic yards of levee on the Mississippi river, over a period of two and one-half years, and will again be faced with the old familiar problem of getting more work to do.

Excavation for 1932 Highway Construction

SUPPLEMENTING the very complete highway forecast which appeared in the January issue of The Excavating Engineer, we report the following additional information through the courtesy of the State and Provincial highway departments mentioned.

CANADA

Ontario

An expenditure of $300,000 on a scenic highway from Coboconk through Minden and Carnarvon in Haliburton County to Dorset on the Muskoka boundary is understood contemplated by the Ontario Department of Northern Development as a relief measure.

Quebec

Deputy Minister N. Boulanger, advises that it is impossible at this time to give any idea of highway plans for 1932 as nothing has been discussed or studied up to the present time. It will probably be several months before the 1932 program for Quebec is available.

A report in the November 14th Official Bulletin of the Roads Department inventories, as of January 31st, 1931, 34,591 miles of rural roads. Of this, 15,090 miles, or 44% had been permanently improved by the end of the 1931 season. The latter figure includes the provincial highways and 2nd and 3rd class roads. The main highways net work comprises 53 arteries whose aggregate length is 5,546 miles. To October 1st, 1931, 5,536 miles, or 96% of these main highways had been improved with 153 miles under construction and 59 miles remaining unimproved. During 1931 the Department executed construction work on the length of 1,172 miles on roads of all classes, and started work not yet completed on 665 miles. Permanent paving was completed on 138 miles of road.

The following table gives a summary of the Department's operation for 1931:

	Miles
Maintenance at Government expense	13,412
Permanent pavements laid on roads previously improved	138
Work preliminary to permanent paving	94
Construction completed on main highways	177
Construction completed on second and third class roads	995
Total construction on all classes of road	1,172
Length of construction in progress and not completed October 1	665
Bridges and culverts built or subsidized by the Department, exclusive of those forming part of regular construction work	347
Earth road improved during the season	112
Grade crossings eliminated	12
Sharp turns, curves and other dangerous features eliminated during the season	773
Total length covered by the improvement of turns, curves, etc	353
Length of road maintained for winter motor traffic, winter of 1930-31	393
Ornamental trees planted along main highways (trees)	13,628
Lime supplied to farmers for embellishment purposes (pounds)	674,019

California

During the year 1932, the state of California contemplates an expenditure of $56,000,000 for road work. In addition to this amount, $3,500,000 will be spent on public institutions. James I. Hertz, Deputy State Director of Public Works, has just recently announced that close to 1,000 miles of highway projects will be carried on this year. This is the largest road building program that the state of California has ever had.

During 1931 the California State Department of Public Works constructed 823 miles of highway. This was the greatest total of highway miles ever constructed in one year in the state's history. The closest approach to this record was in 1924 when 712 miles of highway work were completed. This 1931 program represented an expenditure of $41,000,000—all of which was provided from automobile gasoline tax funds.

The following is a list of projects from which plans have been made, and on which call for bids will be issued between January 1st and April 1st:

Alpine County—5 miles grading and surfacing near Lake Alpine	$ 50,000
Butte County—8 miles grading and surfacing Pulga to County line portions	483,400
Calaveras County—1.6 miles grading and surfacing near Angels Camp	35,000
Colusa County—19.1 miles grading and surfacing Abbott Mine to 5 miles west of Williams	193,500
Humboldt County—0.5 mile grading and surfacing approaches to east branch of Eel River bridge	30,000
Imperial County—14.7 miles grading and asphalt paving Coyote Wells to Dixieland	598,000
Los Angeles County—7.4 miles grading and paving Las Flores Canyon to Santa Ynez	294,000
Los Angeles County—5.6 miles grading and paving from Dana Paint to Laguna Beach	470,000
Los Angeles County—3.7 miles grading and paving Newport to Corona Del Mar	203,233
Los Angeles County—1.1 miles pavement widening from Oxnard to El Rio	26,400
Los Angeles County—5 miles grading and bridges from Tujunga to La Canada	127,00
Los Angeles County—10.5 miles paving from Sepulveda Boulevard to Calabasas	209,000
Nevada County—11.8 miles surfacing Nevada City to Washington Road	41,000
Orange County—5.7 miles paving, widening from Irvine to Tustin	184,096
Riverside County—16 miles grading and surfacing portions of Mecca-Blythe Road	700,000
Riverside County—8.3 miles grading and paving from 6 miles north of Imperial County Line to Avenue 62	481,400
Riverside County—6 miles from Imperial County Line to 6 miles north	391,000
Sacramento County—1.5 miles grading and paving Cosumnes River to McConnel	26,600

San Bernardino County—10 miles grading and surfacing from Baker East	334,498
San Bernardino County—Grading and paving west entrance to San Bernardino	150,000
San Diego County—3.5 miles grading and paving portions from El Cajon to Las Coches Creek	191,566
San Diego County—2.9 miles paving, exceptions from San Diego Oceanside	87,000
San Luis Obispo County—8.6 miles grading and surfacing from Cambria to San Simeon	210,000
Santa Clara County—3.4 miles grading and paving Ware Avenue to Stephens Creek Road	65,900
Shasta County—8.9 miles grading and surfacing Hat Creek Summit to Fall River Mills	440,000
Siskiyou County—0.5 mile grading and surfacing at Beaver Creek	20,700
Solano County—5.7 miles grading and paving Cordelia to Fairfield	294,600
Solano County—0.3 mile grading and surfacing in City of Vallejo	7,500
Solano County—0.8 mile grading and paving Rio Vista to Rio Vista Bridge	38,600
Sonoma and Mendocino Counties—13.9 miles grading and surfacing Cloverdale to Hopland	900,000
Tulare County—10.6 miles grading and surfacing Lemon Cove to Three Rivers	350,000
Tulare County—3 miles grading and paving from Grapevine Station south	520,000
Tulare County—5.8 miles grading and paving Plaza Garage to Goshen and Plaza Garage to 0.3 mile west	272,000
Ventura County—4.5 miles grading and paving Ventura to El Rio	100,000

Colorado

In 1931 Colorado graded 400 miles of Federal Aid Highway at a cost of $7,100,000 and 30 miles of State Roads, not Federal Aid, at cost of $500,000. Approximately 6,000,000 cubic yards of excavation was involved. Colorado paved 50 miles of highway at a cost of $2,000,000 and graveled about 300 miles for approximately $4,200,000. About 800,000 cubic yards of excavation is carried over into 1932 on old contracts at an average price of 26 cents per yard. It is expected that there will probably be a decrease in Colorado road work for 1932 from the above figures covering work of last year.

Kentucky

In the forecast on Kentucky's Highway work appearing in our January issue an error was made in reporting the bridge work. The bridge over the Cumberland at Canton was opened for traffic January 1st, that over the Tennessee at Eggner's Ferry and the one over the Kentucky at Tyrone will be opened March 1st. The above dates were reported as dates of opening of bids in error and should have been reported as the opening dates of the bridges themselves.

Mississippi

The State Highway Department of Mississippi is still unable to forecast their highway program as the State has not yet been able to dispose of the $5,000,000 bond issue authorized.

Oregon

For 1932 Oregon expects to grade 50 miles of new road at an estimated cost of $750,000. This will involve about 1,500,000 cubic yards of excavation. Approximately another 1,000,000 yards will be moved in reconstruction of 50 miles costing $500,000. About 60 per cent of this 2,500,000 yards will probably be handled with power shovels. Oregon will carry over on old contracts about 10,000 cubic yards of excavation to cost approximately $50,000. Oregon's paving program calls for 15 miles of pavement to cost $375,000 and 100 miles of gravel or crushed stone to cost $600,000. This present estimated program represents a decrease of about 50 per cent from actual expenditures of 1931.

South Carolina

Unless and until the State is able to market additional Highway Bonds, or funds are provided from some other source, the construction program will be practically at a standstill.

An attempt to sell $10,000,000.00 in bonds on December 23rd was unsuccessful, and as a result the State Highway Department has had to resort to a retrenchment program. It is hoped, however, that the condition of the bond market will improve materially and the State can sell its bonds so the construction program can go forward at an early date.

Texas

The State Highway Department is letting contracts each month in the year and placing projects under construction as the plans are completed and approved. Due to a fact that they depend to a considerable extent on the Counties of the State furnishing a part of the finances, they are not able to formulate a definite program of construction for a twelve months' period.

During 1931 Texas Highway Department placed under construction thirty-five million dollars of all types of construction and now reports they should have available for construction during the current year, equivalent or greater funds than were available for 1931.

"These companionate marriages are apt to prove vexing," said the man who lost his bride's phone number and forgot her address.

After the blast on Massasoit Road, A. I. Savin Company of Hartford, Connecticut is building this Massachusetts State Highway. Herbert W. Wright of Worcester, Massachusetts owns and operates the Bucyrus-Erie Gas+Air coming through from the other end of this tough digging. In the distance you can see the beginning of Perini and Ampolinis job which starts at the White house.

FIELD NOTES

Ownership of Excavated Materials

AN ENGINEER-READER of *Excavating Engineer* raises these interesting questions: "A contractor looks over a building site where there is a lot of rubbish, paved areas or timber, steel, brick or stone, concrete block walls, etc., to be removed. These materials have some second-hand value. May the contractor legally dispose of them for his own account, where the contract is silent on the subject?

"If the owner disposes of them for his own account, what are the contractor's rights? Can the contractor charge at his contract unit price for the yardage represented by such material?"

On these questions, as well as any other arising under an excavation contract, local custom, if any, will have a controlling effect when the contract is silent. It is a fundamental rule of law applicable to all contracts that where an agreement is silent on a given point the parties will be presumed to have intended to bind themselves by whatever general custom may exist between parties having similar business dealings in the same locality.

Citing cases that have been passed upon by courts of last resort and that involved excavation contracts, a standard legal authority says:

"But a contract to excavate land for the erection of a building thereon does not imply that the title to valuable material removed in performing the contract is transferred to the builder, unless there is a well known custom to that effect, or unless the contract provides that the builder shall remove the surplus earth, with no reservation of title to the owner, and no stipulation or direction as to what should be done with it. A provision in the contract requiring the contractor to make weekly statements in connection with the work does not require him to make a statement as to material removed, where the cost of removing the material was greater than its value." 9 Corpus Juris, 733.

In one of the leading cases on this subject—Welch v. McNeil, 101 N. E. 985—the Massachusetts Supreme Judicial Court recognized that excavated materials may not only belong to a contractor, as against the owner, but also to a subcontractor, as against the general contractor. In that case, the general contract for a building required the general contractor to do the necessary excavation and "cart away and dispose of all soil, rocks, etc., left over from the excavations and filling." The same provision appeared in the subcontract for excavation. Under these circumstances, the court held that merchantable sand belonged to the excavating subcontractor.

In the other leading case—Long Island Contracting Co. v. New York, 97 N. E. 483—a street improvement contract required the contractor to remove "all surplus materials, earth, sand, rubbish and stones." The New York Court of Appeals ruled that removed materials belonged to the contractor, as part of his compensation, saying, in part:

"The requirement that the contractor should remove the surplus earth, *with no reservation of title* by the city, no stipulation that it should be moved to a specified place and no direction as to what should be done with it, except simply to remove it from the line of the work, implies that the contractor could do what he wished with it. . . . The duty to excavate and remove it, without any reservation or condition, made it the property of the contractor as soon at least as it was loaded upon carts or other vehicles for the purpose of removal. In this respect the contract is not unlike one to tear down a house and remove the materials. If nothing is said as to what is to be done with them after they are removed, by necessary implication they belong to the contractor."

As to the last question presented by our correspondent, this legal editor of *Excavating Engineer* is of the opinion that if the contractor permits the owner to dispose of excavated material as his own property, the contractor is still entitled to the unit price for the yardage represented by such material, assuming that the contractor removed it. But if, without labor or expense on the part of the contractor, and with his assent, the owner, or some third person acting under the owner, should remove materials—say, a concrete block wall—the contractor would not be entitled to compensation in the absence of some clause in the contract clearly entitling him to it.

We believe that most courts would be apt to follow the rule laid down by the New York Court of Appeals above quoted. That is, if the contract requires the contractor to remove materials, and does not reserve title to them in the owner nor say what shall be done with them, the contractor is entitled to them on removing them.

—A. L. H. Street, Attorney at Law.

Are You Protecting the Eyes of Your Workmen?

EMPLOYEES doing grinding, chipping or other work endangering their eyes should be provided with suitable goggles. Goggles are classified according to the *National Safety Council* as follows:

(a) To protect eyes from flying objects and molten metal.
(b) To protect eyes from injurious light and heat rays.
(c) To protect eyes from gases, fumes, or liquids.
(d) To protect eyes from dust and wind.

Not only is it important to see that goggles are readily available when they are needed but it is also important to see that men who are doing work which is hazardous to the eyes are instructed and compelled to wear them. Do not give goggles which have been used by one workman to another until they have been sterilized.

Respirators should be provided for men working with cement, lime and other dusty material; also in smoky or gaseous places.

Handy Handle for Small Paint or Varnish Cans

THE common small paint or varnish can is a mighty mean, dirty and unhandy thing to hold in the left hand while using the brush. Take two small sticks, a short and a long one. Nail them together as shown, and snap them to the can with a rubber band cut from an old tire inner tube. Handy, convenient and clean then. Very much so, and easy to make and put on in just a few moments.

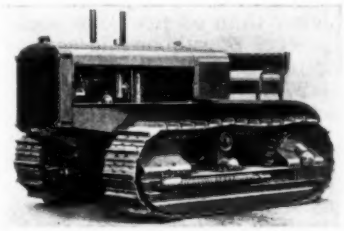
—Frank W. Bentley, Jr.

EQUIPMENT YOU OUGHT TO KNOW ABOUT

New Allis-Chalmers Track-Type Tractor

THE *Allis-Chalmers Manufacturing Company* of Milwaukee, Wisconsin, announces the new Model "L", a six-cylinder track-type tractor, built to meet the modern demand for a powerful, fast, heavy duty, easily handled machine.

The Model "L" has six forward speeds ranging from two to 6½ miles per hour—force feed lubrication — oil, air and fuel filters—removable cylinder sleeves—and many other outstanding features.



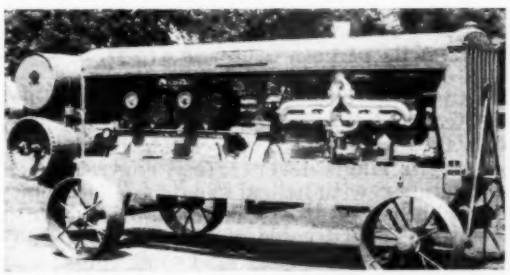
This new tractor has low center of gravity combined with high road clearance, and will handle the largest elevating graders in all workable conditions of road and soil, as well as the largest snow plow in heavy drifts.

This tractor has a pleasing stream-line appearance, and takes its place in the Allis-Chalmers line as a worthy big brother to the famous "35". Additional information will gladly be sent on request. Please mention *The Excavating Engineer* when writing.

Largest Portable Air Compressor

SCHRAMM, INC., West Chester, Pa., well-known manufacturers of Portable and Stationary Air Compressors, have now developed the largest multi-cylinder portable air compressor. This is a 540 cu. ft. displacement unit consisting of an 8"x6" four-cylinder compressor, driven by either gasoline or Diesel heavy-duty Buda engine.

The underlying principles in the construction of this large compressor are the same as those built in the other Schramm machines. One of the interesting features which make this large compressor the most practical in the field, is the self-aligning clutch. This device permits the operator to disengage the compressor unit while the engine is being started. After hand starting is accomplished and the engine running smoothly, compressor load can then be engaged. This distinctive feature makes the starting a simple and easy problem.



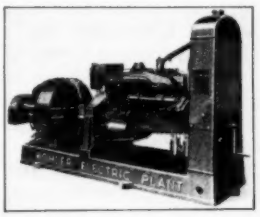
Any mounting—spring trailer, highway trailer, steel wheels, rubber-tired wheels—can be obtained, which greatly increases the adaptability on any construction job. The 540-cu. ft. compressor is also built for the various stationary installations in factories and shops. For further information write the manufacturer, mentioning *Excavating Engineer,* please.

New Kohler Electric Plants

TWO NEW Kohler electric plants, each of which offers twice the capacity of any of the 100 other different models in this line of portable, automatic power and light units, are announced by the *Kohler Company, Kohler, Wis.*

Twenty K.W. D.C. and 25 KVA A.C. current are delivered, respectively, by the two new plants, which have been developed to meet special needs, such as construction camps, etc.

In construction and in operation the 20 K.W. and 25 KVA plants resemble 5 and 10 K.W. Kohler units. The new plants are powered by six-cylinder heavy duty industrial engines of the L-head type, with removable cylinder heads. The extra heavy crankshaft is supported by seven main bearings and full pressure oiling is used to all engine bearings. Cooling is by means of a large size radiator and water circulation pump. The radiator fan is driven by double V belts, either of which is of ample size to drive the fan. Two are used, however, as a safety factor.



The starting system of the new plants is 12 volt and is controlled by a special relay system in order that the unit may be started and stopped by the closing or opening of a two-wire starting circuit. The plant will start and will continue to run as long as this circuit is closed. A 12 volt starting battery is kept charged automatically by a generator mounted on the side of the engine. Standard 110 or 220 volt current is generated by the new plants. The D. C. generators are of the revolving armature compound wound type and the A.C. generators are of the stationary armature and revolving field type with a direct connected exciter. All models are furnished with or without a switchboard.

New Solder, Alumaweld

A SOLDER named Alumaweld, that will repair aluminum and other metals, including pot metal, die castings, cast iron and steel has recently been discovered, according to an announcement by the Allied Research Laboratories of Glendale, Calif. It breaks down the structure of the metal being repaired and fuses or welds with it to form a single piece, according to the Laboratories.

The announcement continues; Alumaweld has a tensile strength of 12,000 pounds, which is more than ten times that of ordinary solder. It is very ductile, and will take a nice polish over which chromium plating or any other plating can be ap-

plied. It is hard enough to be worked or machined, yet exceedingly malleable. Its primary melting point is 370 degrees. Once melted, however, there is a secondary melting point of from 50 to 250 degrees higher, depending upon the period of time that the solder has been allowed to remain in a molten condition. This feature naturally makes for permanence of repairs.

The uses for this new solder are numerous. It will repair aluminum pots and pans, laboratory apparatus, cylinder heads and crank cases on automobiles, heating plants, pipe lines—in fact, anything metal. For many uses it replaces costly welding with equally satisfactory results.

Alumaweld is applied to aluminum, pot metal and die castings with an ordinary soldering iron or blow torch—without flux. For cast iron and steel a special flux is required. Alumaweld is one of the few metals that will not corrode under ordinary circumstances, and there is absolutely no possibility of it rusting, because of its neutrality, combined with the fact that it fuses with the metals to which it is applied. Electrolysis is consequently eliminated. This product was discovered by a well known consulting engineer and metallurgist and is heralded as a real time and money saver by *Allied Research Laboratories of Glendale, California.* Further information will gladly be given. Mention Excavating Engineer, please, when writing.

Haiss Developments in 1931

DURING the last year, *George Haiss Manufacturing Company* has developed some new models of its standard types of equipment, has added some new machines which had not previously been made, and has made various improvements in old models which are being continued. The new models developed include two loaders which have the highest capacity of any machines of the type which have yet been built. These are the Model 80 in Bucket Loaders, and the Hi-Tonnage Coal Loader.

The Model 80 has a loading capacity of 3 cu. yds. per minute, or more, in sand, gravel, broken stone and similar materials; is intended for the big operator who operates plenty of trucks and desires to dispatch them with a minimum of lost time.

The Hi-Tonnage Coal Loader is of the flight elevator type with steel chains, a steel trough and steel flights; has a loading capacity of 4 tons of steam coal per minute; intended for all sorts of coal with the exception of large lumps and, therefore, for the large coal operator using ground storage and big trucks.

Two smaller loaders for sand, gravel, crushed rock, etc., have also been developed, the Model 50, with a capacity of 1¾ yards per minute, and the Model 30, with a capacity of 1¼ yards per minute. These are intended for lighter work in stock piles where smaller quantities of material are to be handled.

A new development is the hopper car unloader for use in conjunction with portable belt conveyors for unloading material such as sand, broken stone, or coal, from hopper bottom cars and placing it into stock piles or into trucks. This is placed under instead of over the rails at semi-permanent or temporary set-ups, and has several advantages over unloaders which rest on the rails.

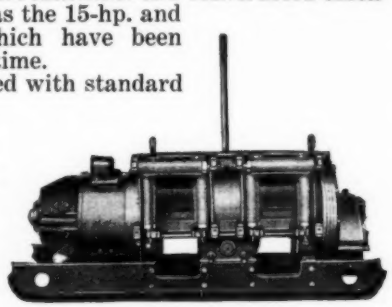
The latest development is the concrete distributor for paving work, for use in handling ready-mixed concrete delivered in trucks, or truck-mixed concrete. The missing link, according to the manufacturer, in the use of concrete delivered in trucks on paving work has been a method of distributing the concrete properly and at sufficient speed to make paving laid with ready-mixed concrete more economical than by using the standard paving mixer. Haiss Concrete Distributors for handling concrete for 20-foot a full width pavement and also for 10-foot slab work have been developed to meet needs for this equipment.

Among the improvements made in the old models are—to the Model A excavator—the bucket cleanout, an overload release clutch to protect the engine and transmission parts, and a new transmission box housing the clutches giving all parts the required amount of oil. Haiss "Hi-Power" Clamshell Buckets are now available with Hyatt bearing sheaves, one-piece bowl and full-length jaws which are both wider and thicker than on previous buckets. A heavy double squeegee of rubber and canvas fabric for use in handling concrete has been designed. On the Model 27 Loader a cutting blade for application to the feeding propellers has been developed. This is to be used in digging and loading top soil.

Full information on any of the new models mentioned above or on any of the various recent improvements made to existing models will gladly be sent by this manufacturer whose address is 144th Street and Park Avenue, New York, N. Y. Please mention *The Excavating Engineer* when writing.

New Sizes of I-R Slusher Hoists

INGERSOLL-RAND CO., 11 Broadway, New York, has added two new sizes to its line of electric double-drum hoists for slushing service—the No. 207, of 7½ horsepower, and the No. 210, of 10 horsepower. These machines are constructed essentially the same as the 15-hp. and 20-hp. sizes which have been made for some time.



When equipped with standard A. C. 220-440-v., 3-phase, 60-cycle, or D. C. 230-250-v. motors, No. 207 will give 2,000 lbs. rope pull at 125 ft. per minute, and No. 210 will give the same rope pull at 165 ft. per minute. The cable capacity of both drums is 475 ft. of ⅜-in. or 275 ft. of ½-in. for both hoist sizes.

Features of these new hoists include: fully enclosed construction which protects drums, clutch, and brake; brake lock; two-clutch, balanced drum drive, with single lever safety control; enclosed gear chamber, with helical silent type gears operating in a bath of oil; foot-controlled brakes; adjustable, case-hardened cable rollers mounted on Timken roller bearings; steel skid mountings; and accessible external motor.

These new hoists are designed for slushing service in metal and coal mines, and for general scraping and dragline operations in industrial fields.

Not on the level

Diner—"Waiter, I'll have a pork chop with fried potatoes, and I'll have the chop lean."

Waiter—"Yes, sir. Which way, sir?"

Rain or shine, these two LINNS carried capacity payloads on this job of Warren Bros. Roads Co. Photo to the right taken Nov. 11, '31 —below, Oct. 28, '31

AHEAD OF SCHEDULE . . .

despite a tough break in weather

There were no shut-downs — no loss of time with expensive plant equipment idle — on this job of Warren Bros. Roads Company. » » Dry days with hard road bed . . . wet days with mud near axle deep . . . the job moved ahead at full speed. Nothing stopped this LINN equipment. » » LINN'S sure-footed power — LINN'S huge payload capacity — LINN'S day in and day out utility brought this job to a finish ahead of schedule. » » LINNS should be included in your dirt-moving equipment. Let us send you full details.

LINN TRACTORS

Patent No. 1,270,531
Patent No. 1,521,454
Patent No. 1,685,641
Patent No. 1,685,676
Patent No. 1,701,979
Other Patents Pending

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Division of LA-FRANCE-REPUBLIC Corporation

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Canadian Linn Distributors: Mussens Limited, Montreal

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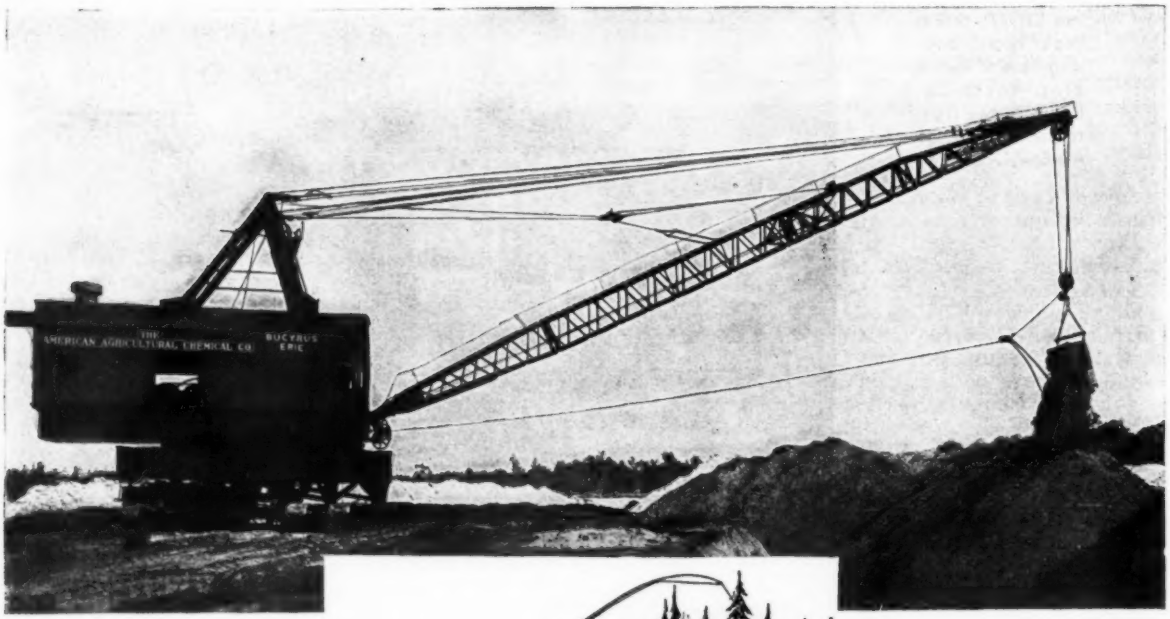

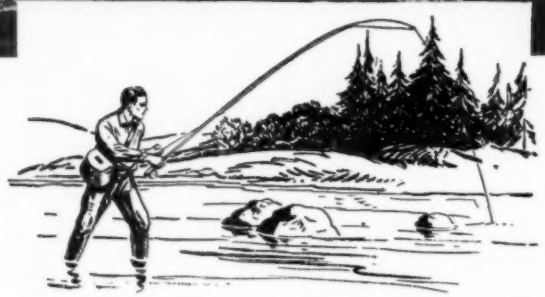

A Perfect Cast and a Swift Return

...*When* ELECTRICITY *Tosses the Bucket*

DRAGLINE operation becomes as graceful—as accurate—as the casts of an expert fisherman when G-E electric drive helps toss the bucket. Upgrade or down, G-E electric drive with variable-voltage control places every movement of the flying bucket under perfect control—assuring an accurate cast and a swift, easy return.

No matter whether you are using dragline or shovel—no matter whether you are dragging or shoveling in sand, clay, or stone, you'll always find an extra advantage in reliability and power in G-E electric equipment. Unfailing dependability, dogged strength, close—*exact*—control, simplified design, and economy of operation—all characterize G-E drives for shovels—all serve to make G-E drive the choice of thoughtful contractors.

An inquiry addressed to your nearest G-E office will bring you detailed information.

200-489

GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

For your convenience in writing to General Electric Company you will find a card bound in this issue.

SHOTS FROM THE FIRING LINE

Detroit Road Show Draws 22,600

"PEOPLE interested in highway activities must organize to acquaint the public with the advantages of good roads and especially how roads can be built profitably and economically," stated W. R. Smith, President of the American Road Builders' Association, in summarizing the results of the 29th annual convention and road show which assembled over 22,600 road builders in Detroit.

"The gasoline tax is a highway tax," declared Mr. Smith, "and any diversion to purposes other than roads and streets will be opposed not only by those interested in highway activities but by twenty-six million motorists who are now contributing a large part of the funds used for road and street building."

The convention and road show held this year in the commodious city exposition building, in Detroit, was notable for the comprehensive and diversified exhibits of road building and maintenance equipment and material. Particular emphasis was given to low cost road construction and maintenance, and the showing of motor trucks in which 90 per cent of the truck manufacturers were represented with extensive displays. Marked interest was shown by the thousands who attended.

In the 40 convention sessions the problems of construction and maintenance, traffic, motor freight, and other subjects related to highway activities were thoroughly aired and innumerable recommendations made.

At the general meeting on road and street planning, President Hoover contributed the statement that "the American Road Builders' Association is rendering an important public service not only in extending the highway system of the country, but in connection with an increased road building program as a means of employment. Road building by federal, state and city agencies is a major factor in unemployment relief." The meeting mobilized the army of state, county and city officials, engineers, contractors, commercial highway users, and manufacturers to fight any tendency to slow down construction projects in the name of economy, and to divert to other uses than road and street construction and maintenance the tax money derived from motor vehicles.

Thos. H. MacDonald, chief of the U. S. Bureau of Public Roads, in an address at the planning meeting said that "the cost of road building is now 45 per cent below the 1924 prices. The diversion of highway revenue taxes for other than state highway purposes is now $150,375,000 annually and the tendency to reach into these special highway taxes is the most alarming one with which we have to contend so far as the future of a stable and adequate road program is concerned."

T. H. Cutler, chief engineer of the Missouri highway department, was elected President of the American Road Builders' Association to take office in May. The City Officials' Division elected R. B. Brooks, Director of Public Service, St. Louis, as President, and the County Highway Officials' Division elected W. O. Washington, County Engineer, Brownsville, Texas.

January Conventions at Pittsburgh

ON January 19, 20, 21 and 22nd the National Crushed Stone Association met at the William Penn Hotel at Pittsburgh for their 15th Annual Convention. There was an excellent attendance of representative men of the industry present and interesting programs and discussions were received with the enthusiasm.

After President A. L. Worthen's address on Tuesday morning, followed reports of directors on business conditions in 1931 and the outlook for 1932. At the afternoon session H. P. Chapman spoke on "Methods of Reclaiming Old Macadam Roads"; Dr. H. S. Hulbert on "Modern Usages of Ancient Inherited Mental Tendencies"; Dr. G. D. Beal on "Science in Industry"; and P. B. Reinhold, Chairman of the Research Advisory Committee, talked on his committee's activities and program. On Tuesday evening was held the formal opening of the Exhibit of the Manufacturers' Division in the Exposition Hall. Included in the Wednesday's program were addresses on: "Effect of Coarse Aggregate on the Durability of Concrete" by P. J. Freeman; "The Trend in Specifications for Crushed Stone" by H. S. Mattimore; "Dolomite Sand in Concrete" by L. M. Dow; "Stabilizing the Highway Building Program" by Chas. M. Upham. Wednesday afternoon was divided between meetings of Cost Accountants and meetings for those interested in Sales Problems.

On Thursday Fred E. Swineford spoke on "Airport Pavement Requirements"; Dr. Ralph J. Watkins on "The Swope and Related Plans for Business Stabilization"; Gilbert H. Montague on "Legality of Sales Mergers"; Harold Williams on "Business Stabilization and the Anti-Trust Laws" and William E. Hilliard on "Why Adopt the Association's Uniform Cost Accounting System?".

Thursday afternoon was devoted to two separate meetings of operating men, superintendents and manufacturers during which A. T. Goldbeck introduced speakers on the "Preparation of Clean Stone"; Harry H. Brandon and H. W. Craig talked on "Methods of Washing Stone"; F. W. Schmidt, Jr., on "Other Methods of Cleaning Stone" and W. E. Farrell spoke on "From Quarry Face to Crusher". The other Thursday afternoon meeting was that of the National Agricultural Limestone Products Association, Inc. On Thursday evening the annual banquet was held.

On Friday Henry D. Johnson, Jr., J. L. Shiely and J. E. Burke talked on "Ready Mixed Concrete"; W. M. Burruss on "Business Conditions" and A. P. Crosley on "Present Trends in Railroad Ballast Specifications". Reports on various committees were heard and the meeting adjourned with a farewell luncheon Friday noon.

The National Ready Mixed Concrete Association, Inc., met for their Second Annual meeting at the William Penn Hotel on January 25 and 26th. The meetings were well attended and a number of interesting talks were heard. Tuesday's meeting was of unusual interest being devoted to an open forum discussing various subjects of outstanding interest to the industry.

The National Sand and Gravel Association, Inc., held their 16th annual convention at the William Penn Hotel, January 27, 28 and 29th. A summary of this meeting will appear in our March issue.

American Ceramic Society Meets Feb. 8th to 12th

THE American Ceramic Society holds its 34th annual meeting at Hotel Willard, Washington, D. C. and Baltimore, Maryland on February 8th to 12th. With this meeting is combined that of the National Brick Manufacturers Research Foundation. Guest speakers are: Eckardt V. Eskesen, John C. Hostetter, Dr. Frederick Wilson, Richard F. Bach, George Oakley Totten, Jr.

General Contractors Hold 13th Annual Meeting

THE THIRTEENTH Annual meeting of the Associated General Contractors of America was held January 18 to 21 in Milwaukee. Attendance numbered approximately 550, and, considering business in general, the convention might be called one of the most successful ever held.

Among the topics presented on the program were: **Construction Credits** by Ward P. Christie, Ulen & Company, Lebanon, Indiana; **Construction or Obstruction** by A. P. Greensfelder, President, Fruin-Colnon Contracting Company, St. Louis, and President, Associated General Contractors of America; **Construction in Soviet Russia** by J. C. Baxter, Carey, Baxter and Kennedy Co., New York City; **Construction Legislation** by George B. Walbridge, Vice-Pres-

Announcing

....WE have purchased the Clam Shell and Dragline Bucket and Heavy-Duty Trailer business of the G. H. Williams Company. Williams *extra yardage* buckets — built in sizes and types to meet any requirement—used by successful contractors everywhere—will continue to be marketed under their well-known trade-name—

WILLIAMS
FAST-DIGGING BUCKETS

THE WELLMAN ENGINEERING CO.
7002 Central Ave., Cleveland, Ohio
Birmingham Chicago Detroit New York
Pittsburgh Mexico

Shots From the Firing Line — *Continued*

ident, Walbridge-Aldinger Co., Detroit, and Past President, Associated General Contractors of America; **Prequalification** by B. L. Knowles, President, E. D. Ward Co., Worcester, Mass.; **Construction Program for 66-story Radio City Building** by W. G. Luce, Vice-President, Hageman-Harris Co., New York City; **Home Modernizing** by Hon. Walter J. Kohler, Ex-Governor of Wisconsin and President, Kohler Company, Kohler, Wisconsin; **Greater Opportunities for the Great Lakes** by Col. E. M. Markham, Division Engineer, United States Engineers, Cleveland, Ohio; **Hoover Dam** by Henry J. Kaiser, Chairman Executive Committee, Six Companies, Inc., and Vice-President at Large-Elect, Associated General Contractors of America; and **Can You Use $100,000?** by John Russell, Jr., United Engineers and Constructors, Inc., Newark, N. J., and General Chairman, Construction Section, National Safety Council.

The program also included visits to many of Milwaukee's large manufacturing plants, while the final event scheduled was a trip to the unique Village of Kohler, Wisconsin, home of Kohler Company. More than one hundred visitors to the convention made this trip.

W. A. Starrett, President, Starrett Bros. & Eken, New York City, was elected President of the Associated General Contractors at this convention. Unfortunately Mr. Starrett was prevented by illness from attending.

No Lost-time Accidents

THREE of the country's large cement plants, the Northampton, Pennsylvania; Leeds, Alabama; and Independence, Kansas, mills of the Universal Atlas Cement Company, went through 1931 without a single lost-time accident. This was announced by B. F. Affleck, president of the company, a subsidiary of the United States Steel Corporation. The Northampton plant is the largest in the country ever to operate a full calendar year without a lost-time accident. The Portland Cement association annually awards trophies to plants making such records.

Announcement of this record marked the second outstanding safety achievement made by the Universal Atlas company during 1931. In June, all nine of the company's plants went for a month without a single lost-time accident.

New Railroad Proposed

THE Denver Pacific has applied to the Interstate Commerce Commission for authority to build a new railroad from Denver to San Pedro harbor, California, 800 miles, without branches, via Grand Junction, Colorado, Moab, Utah, and Barstow and San Bernardino, California, following the Colorado river for a large part of the distance. A map was filed with the application but other details were reserved for the return to the commission's usual questionnaire. The application was signed by Coleman Crenshaw of Salt Lake City, as president, and it was stated that the company had recently been incorporated in Delaware and that it has no connection with any other railroad. It is proposed to finance by selling stock and bonds.

T. H. MacDonald Judged

BECAUSE of his outstanding contribution to highway progress, Thomas H. MacDonald, Chief of the U. S. Bureau of Public Roads for the last twelve years, has been presented the newly established George S. Bartlett Award. The presentation was made at the opening session of the annual meeting of the American Road Builders' Association.

The George S. Bartlett Award, created jointly by members of the American Association of State Highway Officials, the American Road Builders' Association and the Highway Research Board, honors Mr. Bartlett whose vision, energy and personality have made him a prime factor in the spread of modern highways. Secondly, it will honor each year some individual whose interest in highways has been of national benefit.

Mr. MacDonald's professional life has been devoted entirely to the cause of better highways. In 1904 he began as an assistant in the newly created Iowa State Highway Commission. Shortly he became chief engineer of the commission and during the fourteen years he served in that

For your convenience in writing to The Wellman Engineering Co., you will find a card bound in this issue.

Cheaper Grading

THE powerful milling action of the HAISS EXCAVATOR is like nothing else in digging machinery. You get the capacity of a shovel or skimmer scoop with a 30 to 50% LOWER INVESTMENT. That's one way to make money on your 1932 work. YOU'LL WANT TO INVESTIGATE—by asking us to send Bulletin 530.

GEORGE HAISS MANUFACTURING CO., INC.

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Representatives in Principal Cities

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HAISS EXCAVATOR

"IT DIGS"

Also: HAISS "MODEL 50", "MODEL 27" and "MODEL 80" BUCKET LOADERS—HAISS "MODEL 31" and "MODEL 27" SNOW LOADERS—CLAMSHELL BUCKETS

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GREDAG
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LUBRICANTS
INSURE ECONOMY
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INSURING
LUBRICATION

GREDAG is the ideal lubricant for equipment that is being placed in service after a period of shut-down. It removes the danger of scoring from bearings that have been exposed to the weather or that have become stiff from weeks of idleness.

IT IS A TRIPLE ACTING LUBRICANT

1 Gredag lubricates exactly like any high quality grease.

2 Gredag prevents metal to metal contact because it contains PURE electric furnace graphite.

3 Gredag develops a graphitic bearing surface, pressure, heat and water resistant, which maintains an unbroken film of lubrication.

Recommended
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Manufacturers
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EXCAVATING
EQUIPMENT

NATIONAL CARBON COMPANY, INC.
Carbon Sales Division
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Shots From the Firing Line — *Continued*

capacity he became one of the nation's most proficient road builders.

In 1919 Mr. MacDonald was appointed Chief of the U. S. Bureau of Public Roads by Secretary of Agriculture David H. Houston, and he again found himself a pioneer, for the Federal Aid road construction policy was then less than three years in practice since it was a distinct departure from the ruling policy of the Federal government during a century of non-participation in works of internal improvement. Under his leadership, the Bureau of Public Roads has become one of the most efficient agencies of the Federal government. The growing responsibilities of the Bureau have been easily absorbed and the success with which Mr. MacDonald has encountered road problems well qualifies him as the first recipient of the Bartlett Award.

Foreign

Colombia

The Departmental Government of Santader del Norte is constructing a highway between Gramalote and Ocana, 34 miles long, at an estimated cost of $1,500,000. When completed it should give quick and advantageous transportation facilities to the lower Magdalena River, and might divert a part of the freight now exported through the port of Maracaibo, Venezuela. At present most of the imports and exports for this Department are handled through Maracaibo.

England

The total payments into the Motor Tax Account during the financial year 1930-31 amounted to £28,523,708 (about $138,810,624). The Treasury share of the taxation was £4,926,306. The commitment of the road fund for 1931 was £62,513,000 (about $304,219,514), including projects recommended for London Cross-River Traffic, for trunk road improvement, and for the 5 years' program.

Spain

On November 25, 1931, the Gaceta de Madrid published a list of State highways (79 projects in number) for the repair of which **contracts are to be awarded** by public bidding before the end of 1931. The total amount will be about 10,000,000 pesetas (approximately $861,000), and will be chargeable to the ordinary State budget. The distribution will cover 1931 and 1932.

New England Notes

By C. B. McCOWN

There will be no road lettings by the State Highway Department of Connecticut until March 1st. A courteous notice advising contractors on the Department's bidding list of their plans in this respect permits Connecticut contractors to take vacations during January and February without missing any opportunity to bid on state road work.

James Vinchette of Rocky Hill, Connecticut, reports very good progress on his road job at Canaan, Connecticut.

Andrew Bratley of Bratley Contracting Company, Melrose, Massachusetts, was in the office recently and reported a very busy season but low prices.

Hagan-Thibodeau of Providence, R. I., report excellent progress on their North Smithfield-Lincoln cutoff. This is the first section of the new by-pass around Providence on U. S. 1.

Several bad grade crossings will be eliminated by the Massachusetts Highway Department this year. **The Greenough Construction Company** has been awarded contract for the first one, that at Littleton on the Mohawk Trail.

Arute Bros. of New Britian, Connecticut are taking advantage of the favorable weather and are pushing their job along at Middelboro, Massachusetts.

For your convenience in writing to National Carbon Company, Inc., you will find a card bound in this issue.

A NEW DUMP CAR

Announcing the WESTERN *Air Operated* END DUMP CAR

"WESTERN" has scored another sensational triumph—a large capacity, air operated end dump car. It is a radical departure from all previous dump car standards and is built extra strong for hard mining and quarry work. Its capacity is 20 cubic yards, level full. This new car is short coupled and compact, and rides the track well. There are many uses for this standard gauge end dump car, built for handling the heaviest material. Ask us about it.

WESTERN WHEELED SCRAPER COMPANY
Dump Cars and Grading Equipment
AURORA, ILLINOIS, U. S. A.

WESTERN

For your convenience in writing to Western Wheeled Scraper Co. you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

New Jersey Notes

The new questionnaires to be filled out by prospective bidders on New Jersey State Highway work have been prepared. These attempt to develop information which will permit determining the financial ability, adequacy of plant and equipment, organization and prior experience of bidders. Bids will be received in the usual way to March 1st, but after that date bidding will come under the new regulations. Questionnaires must be filled out and submitted at least 20 days before bids are submitted. Statements must therefore be furnished before February 15th to permit classification of the contractor by the Department in order to be eligible for March 1st bidding.

Baltimore and Vicinity

By S. M. CHRISTHILF

The Pennsylvania Railroad was using their Bucyrus-Erie Gas+Air on their right-of-way near Baltimore when the accompanying view was taken. The work is part of the program being carried out in electrifying their system from Washington to New York.

Buffalo and Vicinity

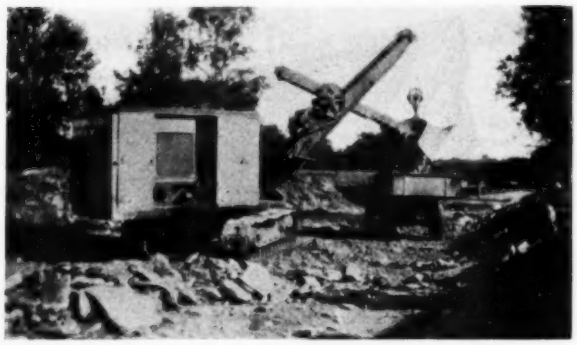
By D. E. WHITE

The Star Sand & Gravel Company, Rochester, under the capable supervision of Mr. Redmond, certainly hit the ball when it comes to getting out material. They are owners of one of few pits in the Rochester territory whose sand was passed and accepted for State Highway construction.

A. A. Johnson of Rochester was fortunate enough to land some 25,000 lineal feet of drainage ditch in the vicinity of Elba, which is well known for the growing of fresh vegetables. This ditch, on completion, will drain a vast amount of muck lands which will then be available for the truck farmers in this locality. At present Mr. Johnson has **Stanley Dodd's** B-2 Bucyrus-Erie working as a dragline, also **C. P. Ward's** P&H and a Northwest. Al hopes to complete this work by the first of April.

Vincent Schiavi of Buffalo was awarded the contract of excavation the 2.20 miles from Hare's Corner-Farnhurst. There is involved in this project 68,000 cubic yards of excavation and other miscellaneous jobs. The total amount of the contract was $53,010.00. This same contractor was also low bidder on the 1.48 miles of excavation from Washington Boulevard Extension to Philadelphia Pike. This contract consists of 17,500 cubic yards of excavation, 9,000 cubic yards borrow, and 5,500 cubic yards of rock excavation. The total amount of the contract was $48,905.00.

Walsh Construction Company of Syracuse, N. Y., recently was awarded two contracts for grade separation work on the New York Central. One of these covers the elimination of the Storm King and Breakneck crossing at Storm King, N. Y., and the other covering the elimination of crossings at Austin, Amherst, Tonawanda, Dearborn and Parish Streets, all in Black Rock, N. Y., near Buffalo.



On the **M&K Engineering Company's** job out of Cape Vincent, N. Y., the above Bucyrus-Erie Gas+Air has been loading and digging rock practically all of the past four months. This job was under the direct supervision of Max Krantz, who is a great booster for the Gas+Air in handling and digging rock. Operator Ray Bull is at the levers.

Pittsburgh and Vicinity

By J. S. WEAVER

The John F. Casey Company, Pittsburgh, was awarded the contract by Public Works Director Edward G. Lang, for the installation of piping to connect the new Brilliant Pumping Station with the city's water line.

The Vang Construction Company has been awarded a contract by the Baltimore and Ohio Railroad for the underpass project at West Talmadge Avenue, Akron, Ohio. Work will be done under the supervision of A. C. Clark, Chief Engineer for the Railroad with offices in Pittsburgh.

Clearing of the Pymatuning Dam property will be done by men directly employed by the Department of Forests and Waters, Louis M. Staley, Secretary. The State has already started the erection of four camps in which to house the men engaged on the work. It is expected the work will be well under way by the second week in January.

The McCrady Construction Company, Pittsburgh, has been awarded the contract for 2,400 lineal feet of concrete roadway 18 to 20 feet wide, for the Buhl Foundation housing project on Mt. Washington. Charles L. Woodridge is the engineer in charge for the Buhl Foundation.

Dravo Contracting Company, Pittsburgh, has been awarded a contract by the Pittsburgh & Lake Erie for erection and completion of a dock at the new river rail transfer plant at Colona, Pa.

HARRY H. DRIVER

The many acquaintances and friends of Harry H. Driver were shocked and grieved to learn of his sudden death on December 30th.

Mr. Driver, at the time of his death, was employed by Bucyrus-Erie Company as a salesman working out of the Pittsburgh office. He was the son of the late Charles M. Driver, contractor of Pittsburgh, and during his early life assisted his father in the construction of several important bridge projects in the Pittsburgh district.

Mr. Driver was born in Pittsburgh and attended the public schools there. He was later a student at Bellefonte Academy, Bellefonte, Pennsylvania; also studied one year at Phillips-Andover Academy. He graduated from Dartmouth College in 1910.

Shortly after leaving school he left for the West where he was employed by various railroads on engineering work. From 1915 and until the time of his death, he spent most of the time in western Pennsylvania. Prior to coming with Bucyrus-Erie Company in February, 1929 he was connected with the State Highway Department as Engineer. He was associated with the Barber-Greene Company at their Pittsburgh office from 1923 until 1929.

He is survived by his widow, two children, two brothers and two sisters.

Thousands have found WILLIAMSPORT *More dependable*

From the smallest sizes to the largest wire rope used in America, Williamsport has proven its outstanding superiority in point of service.

The great Mahanoy Plane Rope, made by Williamsport has demonstrated over and over the increased service possible by our process of manufacture.

Let us tell you more about it.

WILLIAMSPORT *Wire Rope*

PORT CAST STEEL

WILLIAMSPORT WIRE ROPE CO.

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General Sales Offices
Peoples Gas Bldg., CHICAGO

For your convenience in writing to Williamsport Wire Rope Co. you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

Thomas George, that well known Braddock contractor was a visitor to our office some few days ago. Mr. George was looking well and reports having had a very good season with his two Bucyrus-Erie shovels.

Freeland, McHale & Patten, Inc., Pittsburgh, have completed their State Highway contract near Kittanning, Pa. in record time with a type 30-B and a Gas+Air Bucyrus-Erie and tractors and trailers. This outfit sure go places and do things.

The Indiana Limestone Company of Chicago has been awarded the stone contract for the Pittsburgh Post Office, now under construction. The contract calls for about 600 car-loads or 250,000 feet of stone; shipments will begin in about sixty days and will continue for about six months.

Robert Jones, operator, and **John King, oiler**, are maning a Bucyrus-Erie type 37-B for the **Polino Construction Company** on West Virginia State Highway work near Mathias. This work will be completed well ahead of contract time and is being done under the personal supervision of Sam C. Polino, Fairmont, West Virginia.

The Cashion Slag Company, Butler, Pennsylvania, seems to have fallen into the regular habit of crashing slag loading records at the Donora, Pennsylvania, plant; the loading is done by Bucyrus-Erie 50-B electric and a Gas+Air shovels. Mr. W. M. Lunan is Superintendent, with A. L. Smith operating the 50-B, H. M. Robertson, operating the Gas+Air and P. T. Thornton, Master Mechanic.

Ohio Notes

The Troyer Contracting Company of Aurora, Ohio, was recently awarded contract for grading and drainage in Portage County on State Road 80 on their bid of $28,762.75.

Teacher was giving a lesson on the weather idiosyncracies of March. "What is it," she asked, "that comes in like a lion and goes out like a lamb?"

And little Julia, in the back row, replied: "Father."

BULL-DOG

Wedge Rope Sockets are the safest, quickest and most convenient way of attaching wire rope. BULL-DOG sockets are special annealed steel castings, designed so that the rope pulls directly in line with the point of attachment. They can be applied by unskilled labor and without special tools—and—they never let go.

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Ship to_____

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_____ BULL-DOG sockets, rope size_____

pin size_____ jaw opening_____

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Detroit and Vicinity

By G. HENRY

It was a big job to wreck the old Post Office building in the short space of time allowed for it, but when seven Bucyrus-Erie machines went after the job it was finished in the time allotted. **The Morris G. Laramie Company** put five of their machines to work, one 1030, two Type B-2 shovels and two Type B-2 cranes. The one shown in the picture is equipped with an 80-foot boom. Gus Bloink, operator of this particular crane, informed us that he handled stone weighing as much as 8 tons. **Harold Miller** was on the same job with his Type B and the **Chas. Roger Company** with a 41-B. The new Post Office and Federal Building to be built on the same site, at Fort and Shelby Streets, will cost approximately $5,650,000. It will be ten stories high, 260 feet and 270 feet in length and width.

J. S. Ventrelle, Detroit, was low bidder recently for 7,154 miles of gravel on M-76, Kalkaska County, his bid being $101,052.00.

Kentucky Notes

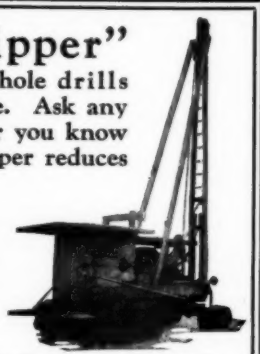
The approach grading to the Kentucky River Bridge at Gratz was awarded to **Southeastern Construction Company** of Eminence, Kentucky.

Corum Brothers of Madisonville were awarded 9.952 miles of highway grading in Christian County.

Award for 3.32 miles grade and drain on the Greenville-Rochester Road in Muhlenberg County went to **Young & Lyons** of Rogersville, Tennessee on their bid of $25,074.

"Loomis Clipper"

"Loomis Clipper" blast hole drills give you cheaper footage. Ask any "Loomis Clipper" owner you know to tell you how the Clipper reduces his drilling costs.



Made in steel or wood frame or all steel and for wire or Manila line.

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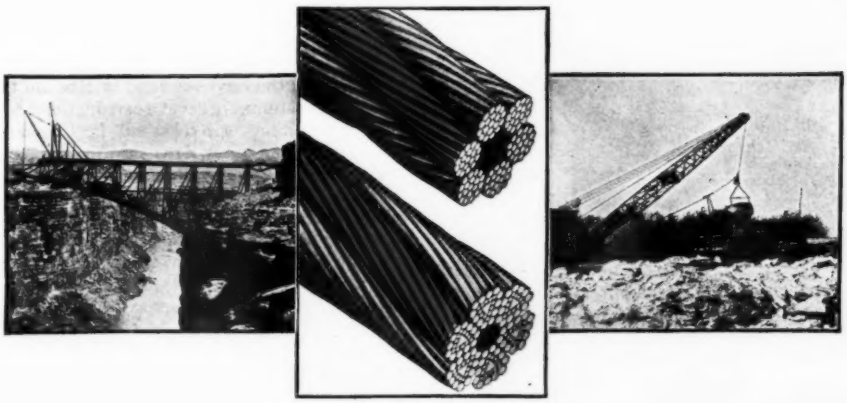

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It is a well known fact that a lot of time and money are spent every time a worn out wire rope has to be replaced.

"HERCULES" (Red-Strand) Wire Rope is exceptionally long-lasting because it is made of acid open-hearth steel wire, which is first rigidly tested by us to make sure that it meets our exacting standards. Any wire that falls short of our requirements is promptly rejected. The accepted wire is then made into rope according to our own exclusive manufacturing methods.

There are many other reasons why "HERCULES" (Red-Strand) Wire Rope is able to withstand so much wear and tear — but results are what count, and we therefore submit for your consideration the long service record of this wire rope. Do not hesitate to try it on your hardest work. We also recommend it for jobs where the margin of profit is small as it helps to stabilize operating costs. We shall be glad to send you a copy of our catalog. We also want you to feel free to write us about any wire rope problems that you may have.

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A. LESCHEN & SONS ROPE CO.

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CHAIN

CHAIN isn't "just chain". There is a vast difference in manufacturing processes—and a wide spread in quality.

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Your chain problem is a BIG problem. Are you sure you are using the right chain for every particular job? Don't guess on it. Call in a Taylor expert.

Ask about the new Taylor Made Special Wear Resisting Dragline Chain. Or, for general chain information, let us send you a copy of Catalogue "A". It will not obligate you in any way but it WILL help you give due consideration to chain.

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DEPT. B. HAMMOND, IND.

TAYLOR MADE
HAND-ELECTRIC AND MACHINE WELDED CHAIN

Shots From the Firing Line — *Continued*

Indiana Notes

LaPorte County Surveyor Earl Alexander is making plans and specifications for several highway improvements petitioned for construction this year. Among the projects contemplated are the following: Misener and Crosby roads in Michigan City to be built by Michigan township at cost of $135,000; the Szynski road in Hudson township 2.25 miles graveling; Mennie gravel road in Cass township 2½ miles; Bowell ½ miles gravel road in Kankakee township; and Reeg road in Center township.

St. Joseph County Commissioners have postponed all action on the Nasturtium road, in line for improvement this year, until 1933.

Mayor R. O. Johnson of Gary has announced that failure to sell tax anticipation warrants as planned this month will force delay on the start of dredging Little Calumet river between the eastern and western city limits, known as Burns' Ditch.

On the "running board" of the big stripper we caught, from left to right, J. A. Forsyth and A. M. Owen, operators, "Punch" Knowles, field electrician and three pitmen of the day crew of this **Enos Coal Mining Company** 18-yard shovel working near Oakland City, Indiana. The shovel is one of the big Bucyrus-Erie electrics with movable counterweight that are making history in the strip coal field. We hope to present a feature story on the Enos Coal Mining Company operations to our readers in an early issue. The photo comes to us through the courtesy of Operator Owen.

Illinois Notes

Littia Construction Company of Davenport, Iowa was awarded two grading contracts recently, one for section 109 A in Stephenson County on their bid of $59,129, one for section 142 A in Knox and Fulton Counties on bid of $54,644.

A. A. Davis Construction Company of Oklahoma City, Oklahoma received grading contract on 116 A in Johnson and Pulaski Counties on their bid of $57,621.

E. M. Rocho of Freeport drew a $13,197 job of grading on project 1X1A in Lawrence County.

M. Wunderlich of Jefferson City, Missouri received contract for 106A in Stephenson County on bid of $81,327.

J. Kenny and Sons of East St. Louis secured 124A in Calhoun County on bid of $87,430.

Wills Construction Company of St. Louis received two grading awards in DuPage County amounting to $89,552.

E. H. Merrick of West McHenry was awarded grading on 21G in McHenry County for $10,804.

The Board of Supervisors of Cambridge has appropriated $36,000 for the purpose of building a 10-foot concrete pavement with 5-foot shoulders from Ulah corners, 2 miles east of Cambridge, south to Ulah community, distance of about three miles. This highway is planned for construc-

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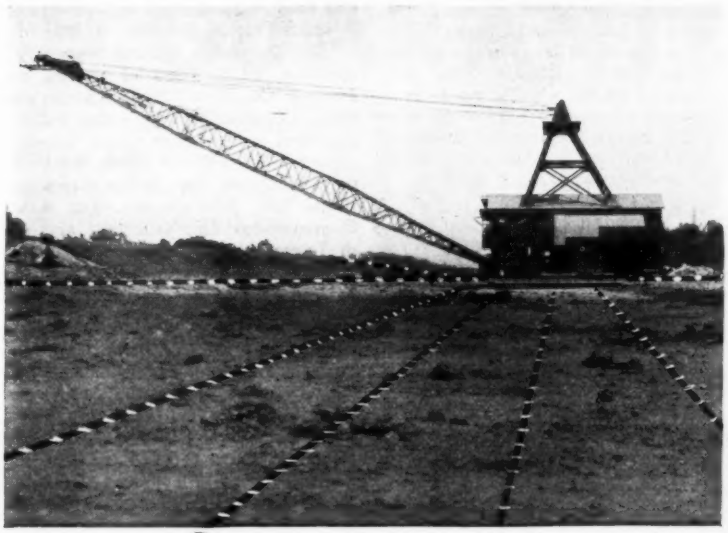
STRAIGHT LINE MOVES



WHEN the Bucyrus-Monighan Walking Dragline is ready to make a move, it points directly toward and steps off in a straight line to the desired position.

The only "turning" done by a Bucyrus-Monighan is the turning or swinging of the revolving platform to point the machine in the desired direction.

This mobility saves strain on the machine, saves time moving, and is one of the features which makes it possible to walk the Bucyrus-Monighan over extremely soft ground. Bucyrus Monighan Company, Chicago, Illinois.

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Walking Draglines up to 8 cubic yards

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B-13

For your convenience in writing to Bucyrus-Erie Co. you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

tion under the motor fuel tax law. James H. Reed, Superintendent of Highways will be in charge of this project.

The bid of W. S. Hardwick of Beardstown, Illinois, was the lowest of eleven submitted to Rock Island district U. S. engineers for construction of a new cutoff levee in the Indian Grave drainage district near Quincy, Illinois. This bid, $18,018, is based on a unit bid of 10.92c a cubic yard. Approximately 165,000 cubic yards of material on a ¾-mile front is the size of this project. **Frank Shannon** of Savanna, Illinois, bid $19,470 to be third low bidder, with bid of $18,876 by **L. E. Sternberg** of Creston, Iowa, being second.

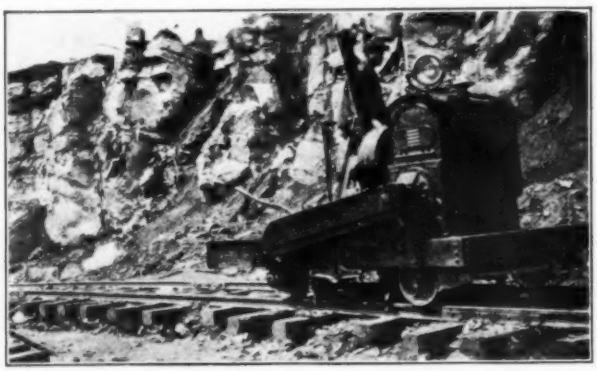
By H. E. SNIPE

The accompanying illustration on the operations of the Eldred Drainage District, Eldred, Illinois, shows **Operator Stiles** and **Oiler Ely** with the Bucyrus-Erie 30-B dragline used for levee building by the District. The machine carries a 40-foot boom and a 1-yard Page bucket.

City Engineer C. A. Heinzelman of Belleville has announced plans for a $20,000 conveyance sewer in the southeastern part of Belleville to be constructed this year.

The City Council of Collinsville is considering sewer work estimated to cost $266,592. The work includes a sanitary sewer system, sewage pumping system, sewage disposal plant, etc. The present sewage disposal system has been condemned.

At Peru a new water line is to be laid from the recently drilled well to the pumping station. This new line will be 18 inches in diameter and 1,452 feet long. Cost is estimated at $6,000.



Shifting Track in the Quarry

Whether it is in the quarry, or on the waste dump where the overburden is disposed of, this machine and a few laborers will do all the required shifting and raising of track.

No large track gang need be maintained. Other operations need not be delayed waiting for track to be moved, or men taken from regular duties to work on track. Modernize your track raising and shifting operations with the Track Machine. It will save time and labor expense.

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED
TRACK SHIFTER

St. Louis and Vicinity

By A. J. KOENIG

Bids for $3,250,000 for the construction of highways in Illinois were received on December 22nd. Another letting was held in Springfield on January 22nd on 22 road projects estimated at $2,289,000. A few of the successful bidders in the December letting were: Sangamon and Christian counties, 12.37 miles of paving on route 126, **Cameron-Joyce & Co.**, $159,701; Sangamon county, bridge over Sugar Creek, **Zimmerly Bridge Co.**, $12,338; Sangomon-Christian counties, bridge over Clear Creek, two culverts and substructure over Horse Creek, **Koss Construction Co.**, $21,277; superstructure for Horse Creek bridge, **S. G. Pool Co.**: Route 107, Pike county, 8.42 miles paving to **McCarthy Improvement Co.**, $142,287; and bridge over Sugar creek in Logan county, **Illinois Steel Bridge Co.**, $25,750. **The Illinois Steel Bridge Co.**, was low on a bridge on route 80 in Joe Daviess county.

Contracts were also let for the following: Route 21, Lake county, 0.65 mile of paving approaches to Soo Line overhead crossing at Lake Villa, **E. H. Merrick**, West McHenry, Ill.; Route 46, Cook county, 1.08 miles pavement widening, **Aiery Construction Co.**, Oak Park, Ill.; Route 83, 4.24 miles paving, Henry and Knox counties, **Henkel Construction Co.**, Mason City, Iowa, $61,992.; Route 116a, 5.60 miles paving, Marshall county, **Helkel Construction Co.**; and Route 130, Cumberland county, 8.02 miles paving to **Granite Bituminous Paving Co.**, St. Louis, 103,843.

The construction program of the Missouri State Highway Commission for 1932 calls for 2,489 miles of roads; 378 miles to be concrete paving, 2,034 miles of gravel surface and 88 miles of grading. Contracts will be awarded as soon as the right of ways are available.

Despite the lack of strength in the petroleum market at the present time leaders of the pipe-line companies estimate that 5,000 miles of new line will be laid in 1932 at a cost of $100,000,000.

In addition the Ajax Pipe Line companies project reported last month, plans for the following lines are announced: The Gulf Pipe Line Co. is expected to increase its facilities between Jenks, Okla. and Pittsburgh, Pa.; The Great Lakes Pipe Line Co. will make extensions on its lines; The Continental Construction Co., is to build a new natural gas line from the Texas Panhandle to Buffalo, N. Y.; and Panhandle Eastern Pipe Line Co. is planning additions to its lines in the Texas Panhandle to Indianapolis, Indiana.

A contract for improving Lucas and Hunt road in St. Louis county was awarded to the **Webb-Boone Paving Company** at a price of $61,760. The highway will consist of two 10 ft. reinforced concrete strips and a 20 ft. center strip of bituminous asphalt for a distance of 8,172 feet. Fourteen bids were received for this work.

Eleven government engineers began a survey at Shawneetown, Illinois, for a waterway canal for coal transportation, the survey of which was approved by the War Department after public hearings and petitions from the district involved.

J. L. Pellum is in charge of the survey party. Work will be completed in two months if weather conditions permit. The survey will be between Harrisburg and Shawneetown on the Ohio River a distance of 30 miles.

Dan Scherer of Kansas City, Kansas, was awarded the contract for grading and paving the Seventh Street Trafficway in Kansas City.

The Santa Fe Lines report a budget of $10,000,000 for 1932 consisting of $4,000,000 for new work on existing lines and $6,000,000 for new extensions.

The Patton-Tulley Transportation Co. of Memphis was awarded contracts for four sections of piling dikes on the Missouri River.

For your convenience in writing to Nordberg Mfg. Co., you will find a card bound in this issue.

BLAW-KNOX BUCKETS ARE GUARANTEED

BLAW-KNOX Dreadnaught Buckets are guaranteed to outdig any other make of bucket of equal weight and size. Ask your nearest Blaw-Knox distributor about this.

Blaw-Knox Digging Buckets have 25 years of engineering experience behind them: they have been constantly redesigned and mechanically improved. Each bucket part by part, is made for the duty it is called upon to perform — from ball bearings to hardened guide rollers it represents extremes of toughness and anti-friction. This means PERFORMANCE which is guaranteed in every Blaw-Knox Dreadnaught Bucket you buy.

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WAGON GRADER

BULLDOZER

TAMPING ROLLER

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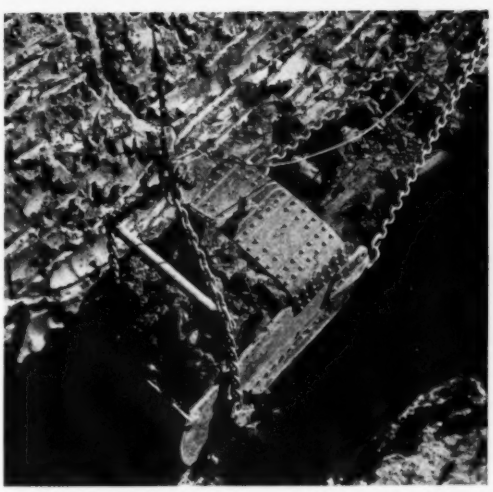
Blaw-Knox Dragline Buckets are built in a wide range of light, medium and heavy weight sizes to suit every demand of dragline service. Teeth and lips are made from high quality manganese steel, highly resistant to abrasion — side walls are liberally reinforced and *do not pull in.*

Fully described and illustrated in Catalog 1247 — ask for it.



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Please send me the following catalogs:

Blaw-Knox Dreadnaught Buckets _____

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Shots From the Firing Line — *Continued*

Morris Wogan has contract for 2200 ft. dikes on the Missouri River.

The United States Engineers' Office in St. Louis received bids on January 27th for placing about 1,355,000 cubic yards of earth work in rebuilding and enlarging the levee of the Big Swan Drainage and Levee District, Scott County, on the Illinois River. The upper flank of the levee is about one mile north of US 36 running from Winchester, Illinois to Florence, Illinois. The South end of the levee district is opposite Montezuma, Illinois. Material is dug from riverside borrow pits and the existing levee. At the option of the contractor material for hydraulic work may be obtained from the Illinois River. There are three items, the first from station 140 to 339, a length of 19,900 feet, with average height of 14.0 has a yardage of 449,000; item two from station 339 to 508, 16,900 feet of 17.0 levee is estimated at 415,000 yards; item three from station 508 to 700, a length of 19,200 feet of 16.5 feet levee, has estimated yardage of 591,000.

Southern Notes

By R. S. WELFER

Highway construction has received a temporary setback in South Carolina, due to the unfavorable condition of the bond market. The State is authorized to sell $20,000,000.00 worth of bonds and hopes at an early date to dispose of part or all of this amount.

In Georgia, Governor Russell made a personal appeal to Washington to authorize $200,000,000.00 worth of highway funds in addition to those already appropriated.

J. W. Barnett, Chairman, Georgia Highway Commission, stated that even if additional funds are not obtained, he expects to spend $16,000,000.00 in the next 18 months on highways in Georgia. Prices bid on work at the January 5 letting were so low that local contractors are encouraged to believe very few outside men will be tempted to come in on this program.

H. B. Dickson of Dickson & Carroll Company, Greenville, South Carolina, has been confined in the Baptist Hospital, Atlanta, for over a month, and is now making good progress toward complete recovery. He felt rather discouraged at one time and drew up "specifications" to call for "bids" from morticians. His many friends are pleased at his recovery and hope to see him out on the job at an early date.

T. H. Winston, Birmingham, is working with H. N. Donahoo on a local drainage project.

Nixon-Phillips Company, Birmingham, report very little work on hand, but expect conditions to improve in the Spring.

Edgar Brothers, McIntyre, Georgia, now have their plant enlarged at Gardners. They are using the Bucyrus-Erie Gas+Air shovel for loading by day and stripping by night and are well pleased with its performance.

Noll Construction Company, Charlotte, North Carolina, have two paving projects under way near Greensboro.

Blythe Brothers, Charlotte, were low bidders on street paving there. There is fairly heavy grading on one of the new streets.

Wannamaker & Wells, Orangeburg, South Carolina, made arrangements to start their work on the Sand Bar Ferry Bridge near Augusta, but were delayed by the first flood of the season.

Work on three other bridges in Augusta was held up by this flood but no damage was done despite the fact that an 80-foot section of the temporary bridge, abandoned a month ago, on the Fifth Street job, broke away at the height of the flood and struck the false work of the C. & W. C. Railroad bridge some distance down stream.

Operator Carlton L. Lavender of Greystone, North Carolina, is operating a 50-B Bucyrus-Erie electric in a quarry for the **Raleigh Granite Company.** Mr. Lavender tells us that this machine has been in service for five years and is "still going good."

By W. W. WHORLEY

The accompanying illustration shows a Bucyrus-Erie D-2 dragline operated by the **Parker Gravel Company** in their clay pit near Monroe, Louisiana. The machine, which is powered with an Atlas Imperial Diesel engine, has proved very satisfactory and economical in operation, according to W. L. Morgan, General Manager. Messrs. Maxey and Walker, who are operating opposite shifts on this dragline, deserve due credit for the way they take care of it.

Texas Notes

By G. H. CARLSON

J. W. Zempter Construction Company has moved their entire organization from Amarillo to Dallas where they can be located at 701 Magnolia Building.

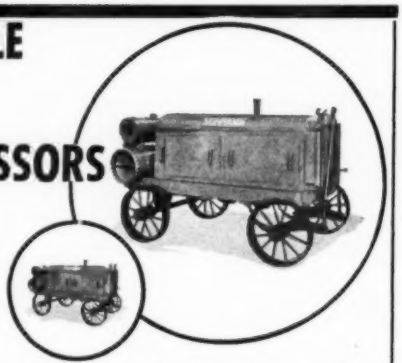
New Mexico

On the January 7th bidding **Hill and Heflin** of Artesia were low on project 8A in Chaves County; **A. O. Peabody** of Las Cruces was low on 168A in Grant and 176A in Dona Ana County.

Old Maid: "Has the canary had its bath?"
Servant: "Yes, he has, mum. You can come in now."

The kangaroo is just one of Nature's abortive efforts to produce a safe pedestrian.

PORTABLE AIR COMPRESSORS



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Eight sizes—36, 72, 120, 180, 240, 360, 540 and 720 cu. ft. displacements—each size built of the same SCHRAMM design and equipped with the clutch (except the 36 cu. ft.) for easy starting.

SCHRAMM Portable Air Compressors are mounted in many types of trailer mountings for adaption on any kind of road, construction or street work.

Write for 1932 Catalog describing the latest SCHRAMM features and sizes.

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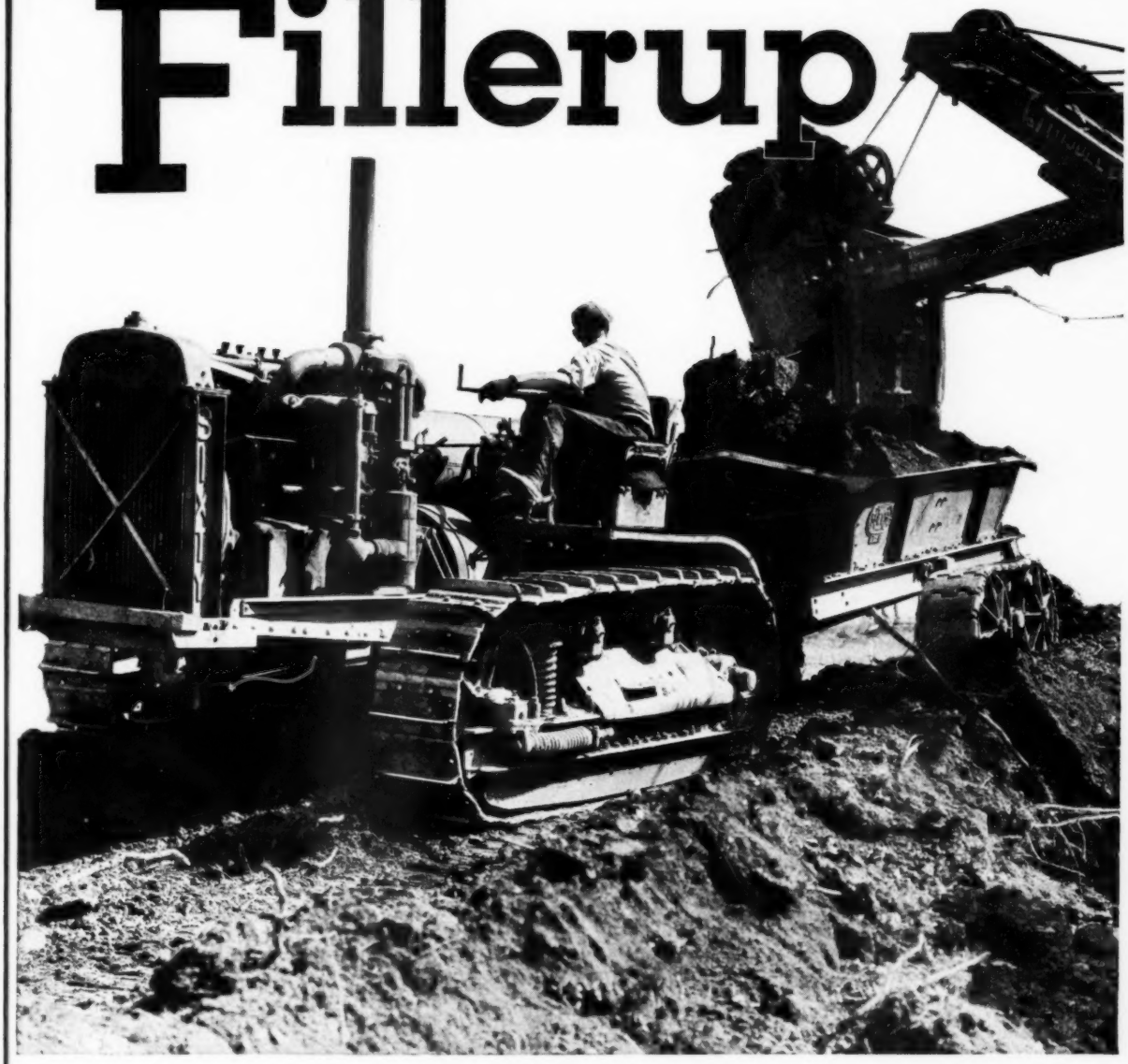

BUILT for full loads is the Sixty "Caterpillar." Built for tough going, sharp turning on the edge of the fill; built for good weather or bad. Built to give uninterrupted service—proved design, balanced power and traction, heat-treated steels. To the contractor his "Caterpillar" track-type Tractors mean rapid progress—and bigger profits.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

Track-type Tractors Combines Road Machinery

(There's a "Caterpillar" Dealer Near You)

Prices—f. o. b. Peoria, Illinois

TEN	$1100	THIRTY	$2375
FIFTEEN	$1450	FIFTY	$3675
TWENTY	$1900	SIXTY	$4175

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REG. U. S. PAT. OFF.

TRACTOR

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Shots From the Firing Line — *Continued*

Arizona Notes

Canion and Royden of Phoenix, Arizona, were low bidders on the Holbrook-Lupton Highway section beginning approximately 14.2 miles Northeast of Holbrook and extending Northeast 2.8 miles toward Lupton. Included in the project are 9,532 cubic yards of drainage, roadway excavation and structural excavation; 33,354 cubic yards of borrow and other items.

Nevada Notes

The Nevada Rock and Sand Company, Inc., of Reno, Nevada were recently awarded contract on their bid of $35,943.37 for construction of that portion of the State Highway System in Churchill County, between 9.59 miles south of Fallon and Fallon.

Colorado Notes

By H. M. BIBAUD

Prospects for expanding Colorado's road building program this year appeared favorable, as announced by Governor Adams, at Denver, January 8th. He stated that, if Congress will make an emergency appropriation as last year to be matched by State Funds, this will permit the Governor and the highway advisory board to put into effect their plan to devote $900,000, the bulk of the gasoline tax proceeds, to small state projects in the effort to help overcome the unemployment condition. No radical revision in the state's road building program was made. Charles Vail, Chief Engineer of the Highway Department, submitted a tentative revision of the Highway budget to the governor. The budget would be used in the event that the emergency appropriation, should, for any reason, be withheld.

A bill to provide $800,000 for the construction for a 60-mile canal to open up the drainage of the waters of the closed basin in the San Luis valley in southern Colorado to an outlet into the Rio Grand River was put before Congress, shortly before the holiday recess. The bill was proposed by the six senators of Colorado, New Mexico and Texas in order to make water available to the farming lands of those states. At present this water is wasted because there exists no means of taking it from the basin.

The J. H. Miller Construction Company of Denver have a $98,000 contract to complete this spring with the opening of the season of approximately two miles west of Bayfield, extending into and through the town, connecting two previously built projects. It closes the unsurfaced gap between Durango and Bayfield. This project includes two new steel bridges over the Pine and Little rivers at Bayfield. About thirty days more work will complete this project.

Cumbres Pass at an altitude of 10,003 feet on the Continental Divide in the San Juan range in one of the most picturesque sections of southern Colorado, lies now under more than twenty feet of snow. Much road work was done in the Pass country in 1931, with the result that a fine road, a part of the transcontinental highway was completed. A crew kept steadily at work there all summer to keep the Pass in condition for travel during the tourist season and to maintain a road station at the summit for the convenience of transcontinental travel. It was hoped that the highway might be kept open all winter. November's heavy snowfall, however, put an end to such possibility. Last year the Pass was opened in June, and it is most probable that the 1932 season will not begin before that time, owing to the severe winter and heavy snows.

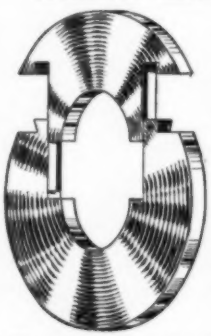
Idaho Notes

The above picture which comes to us through the courtesy of Atlas Imperial Diesel Engine Company and the Western Construction News, shows an interesting dragline operation. The cut is at the head of **Bully Creek Siphon on the Vale project** and is 50 feet deep. The work was handled by **W. H. Puckett of Boise.** The excavation was handled by the above Bucyrus-Erie 50-B Diesel dragline powered by an Atlas Diesel engine. As will be noted the digging was plenty tough.

CUT REPAIR TIME
REPAIR COSTS

This improved Quick Repair Washer will keep gears and pinions in mesh . . . eliminate end thrust . . . saving wear and tear and many costly shut-downs.

Quick Repair washers can be put on a shaft quickly and easily . . . no dismantling of shaft or machinery parts necessary.



Quick Repair Washers "stay put" . . . cannot loosen . . . no pins, bolts or screws are used.

Order Now—the first repair may save you the cost of a year's supply.

When ordering give inside and outside diameters and thickness of washers required.

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DOWN WITH HANDLING COSTS

$ $ $

In these days of keen competition, contractors must keep their handling costs at rock bottom if they expect to stay in the game.

Are you dead sure the ropes on your machines are exactly right for the purpose? Try "Flex-Set" Preformed Yellow Strand and compare results. Then you will be sure!

All the wire for Yellow Strand is drawn to our own specifications from Swedish stock. It is rigidly tested and CAREFULLY SELECTED to provide the balance of elongation, tensile strength, tortions and bends that will result in longest life and economy.

Preforming eliminates the internal stress —makes the rope easier to handle and greatly increases its life and economy under many operating conditions.

All grades of B & B Wire Rope can be supplied "Preformed", as well as in the regular constructions.

Write for catalog 51.

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Shots From the Firing Line — *Continued*

Portland and Vicinity

By M. D. TROYER

Twelve miles east of Vancouver, Washington, this 50-B steam shovel, owned by **Kern and Kibbe,** of Portland, is busy building a railroad grade for a mile-long spur which will connect the Spokane Portland and Seattle main line with a newly opened quarry. Kerne and Kibbe have a government contract to furnish 700,000 tons of rock for the Columbua jetty at the mouth of the river.

Chairman J. C. Ainsworth, Oregon Highway Commission, suffered an injury to his shoulder and arm and is confined to his home. Because of Mr. Ainsworth's unfortunate accident the meeting of the Highway Commission originally called for January 21st has been postponed to February 4th. All matters, including the opening of bids for highway construction projects, which were to come up for consideration at the January 21st meeting will be held over and considered at the adjourned meeting set for February 4th.

PARTNER. For the excavator who wants to cut down digging and handling costs, a Hayward Bucket is sure to prove itself a useful partner. Address The Hayward Company, 52-54 Church Street, New York, N.Y.
ward Buckets

The accompanying view shows a Bucyrus-Erie E-2 Diesel operated by sub-contractors **Fisher and Slattery,** working in a borrow pit. A great deal of the work has been in hard lava rock and the performance of the E-2 has been one of the bright spots of the entire job. The project is expected to be completed shortly after the first of the year.

Washington Notes

General Construction Company of Seattle, Washington was awarded the contract for clearing, grading, draining and surfacing with crushed stone, about 6.2 miles of State Road No. 1 (Lake Samish Branch), Bellingham South, in Whatcom County, involving about 44.7 acres of clearing, 237,320 cubic yards of excavation, 21,430 cubic yards of crushed stone, 5,158 lineal feet of pipe culverts and other items. The amount of the contract was $122,518.56.

The contract in the amount of $132,688.60 was awarded to **Tucker Brothers & Scott,** Kalispel, Montana for clearing, grading and draining and surfacing with crushed stone about 10.5 miles of State Road No. 2, Rocklyn to Creston, Federal Aid Project No. 7-B. This work, in Lincoln County, involves about 20.8 acres of clearing, 239,660 cubic yards of excavation, 33,100 cubic yards of crushed stone, 1,970 lineal feet of pipe culverts and other items.

Edward L. Edland of Tacoma, Washington was awarded a contract in the amount of $14,946.00 for resurfacing and stockpiling about 15,900 cubic yards of crushed stone on about 30.0 miles of State Road No. 9 Hoodsport to Marple Creek, in Mason and Jefferson Counties.

A contract totaling $55,450.50 was awarded to the **Colonial Building Company,** of Spokane, Washington for clearing, grading and draining about 2.7 miles of State Road No. 5, Yakima to Nelson's Bridge, Federal Aid Project No. 161-C in Yakima County, involving about 71,670 cubic yards of excavation, 509 cubic yards of concrete, 5,365 lineal feet of pipe culverts, one 50-foot reinforced concrete T-Beam bridge, one 55-foot steel girder bridge and other items.

Morrison-Knudson Company of Spokane was awarded the contract for clearing, grading, drainage, constructing tunnel and surfacing with crushed stone 2.6 miles of State highway 12 from Fort Columbia to Point Ellice in Pacific County recently on their bid of $122,822.40. Included is 60,080 cubic yards of excavation, 2,813 cubic yards of concrete, 1,867 square yards of concrete pavement, 11,040 cubic yards of crushed stone, 591 lineal feet of pipe culverts and other items. The tunnel involved is 800 feet long.

L. Romano Engineering Corporation of Seattle was successful in bidding on the clearing, grading, drainage and surfacing with crushed stone of 6.9 miles on highway 15 from Index to Gold Bar in Snohomish County. The work includes 316,240 cubic yards of excavation, 18,900 cubic yards of crushed stone, 3,164 lineal feet of pipe culverts and other items.

The Engineering Construction Company of Seattle, Washington was awarded the contract of $30,207.65 for clearing, grading, surfacing with crushed stone and draining about 1.4 miles of State Road No. 21, Kitsap Lake North in Kitsap County involving about 12 acres of clearing, 90,000 cubic yards of excavation, 3,450 cubic yards

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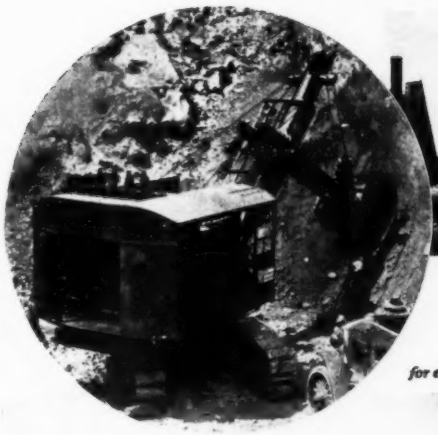
PROFIT-MINDED CONTRACTORS ADOPT ATLAS DIESEL-POWER



for excavators

for rock crushers and mixers

for tractors

IN the operation of a rock-crusher a contractor reports an average saving over gasoline power in fuel cost, of $12.70 a day. On a Long Island dredge, total fuel and lubricating oil cost is only $0.0087 cents per cubic yard. Excavators on the largest construction projects in the world are turning out 10%-15% more yardage with 75%-90% lower fuel costs.

Contractors by the thousands, all over the world, are converting losses into profits, by the adoption of Atlas Diesel-power.

Superiority of the Atlas Diesel over other types of power is thus expressed, in public print, by a prominent Louisiana contractor: "We used gasoline motors for a long time before we were convinced of the superiority of the Diesel engine. Diesel advantages are mainly: (1) low cost of fuel, (2) increased power of at least 25% over a gasoline motor, (3) the small amount of fuel to be hauled and handled.

"We have found from our experience that the Diesel motor uses about one-third as many gallons of fuel as the gasoline motor. Handling the fuel and hauling the lesser amount over rough country is an item very much in favor of the Diesel motor.

"The Diesel motor, besides, will handle a heavy load in a pinch with no slowing down, where the gasoline motor will stall or lose its pep. The Diesel keeps up that same speed, due to inherent characteristics."

In the driving of rock crushers, mixing plants, air compressors, dredges, in shovels, draglines, industrial locomotives and tractors — over 100,000 Atlas Diesel horsepower is now cutting costs and increasing profits for thousands of users in the construction industry.

Lower power costs were introduced to the construction industry by Atlas Diesels. Proof of their unsurpassed operating economies, unique lugging power, lower maintenance cost and simple operation, has led contractors the world over to demand equipment powered with Atlas Diesels.

Cut costs, and meet low-bid competition, with Atlas Diesels. Write for facts. Atlas Imperial Diesel Engine Co., 2867 Glascock St., Oakland, California. Branches and distributors serve the entire world.

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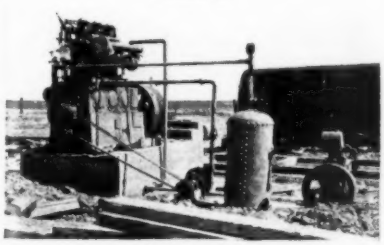

for irrigation

ATLAS *Diesel Engines*

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Shots From the Firing Line—*Continued*

of crushed stone, 1,750 lineal feet of cable guard rail, 430 lineal feet of pipe culverts and other items.

J. F. Konen of Lewiston, Idaho was awarded the contract for clearing, grading, surfacing with crushed stone and draining about 6.0 miles of the Inland Empire Highway Eastern Route, Colton to Idaho State Line in Whitman County involving about 148,940 cubic yards of excavation, 28,850 cubic yards of crushed stone, 409 cubic yards of concrete, 1,503 lineal feet of pipe culverts and other items. The total amount of the contract was $122,911.25.

San Francisco and Vicinity

By J. H. SACKETT

Pacific Gas and Electric Company recently announced a construction budget for 1932 of $31,000,000. Major items in the program include a 50,000 kilowatt steam plant in the southern end of the San Joaquin Valley, a second natural gas transmission line from San Jose to San Francisco and the installation of plant for 56,000 additional horsepower on the Mokelumne project.

Plans and specifications are being prepared by **City Engineer, Walter N. Frickstad, City Hall, Oakland,** for the widening of Park Boulevard from Estates Drive to Mountain Boulevard. Work involves the following approximate quantities: 114,000 cubic yards excavation, construction of three side-hill reinforced concrete viaducts. The estimated cost of the above work is $100,000.

During 1932 the **Los Angeles County Flood Control District** will expend $15,349,000 for improvements. Including for letting prior to July 1st are: San Gabriel Dam Number 2 to be located 9.4 miles up west fork of San Gabriel River to have capacity of 14,000 acre feet. This dam is to be 290 feet high, involving 1,300,000 cubic yards loose rock. Call for bids will be issued at once. Estimated cost is $1,800,000. Tressel over the Los Angeles River, Los Angeles Street to Cerritos, $15,000; Verdugo debris basin, $45,000; Check dams, $100,000; Verdugo wash concrete channel, $50,000; San Gabriel outlet, $600,000; Eaton wash debris basin, $550,000; Pacoima wash spreading grounds Number Two, $95,000; Altadena storm drain, $8,000.

Projects planned for letting after July 1st are: On Los Angeles river, Fletcher Drive to Los Feliz Boulevard, $150,000; San Gabriel river, additional levees, state money, $150,000; Eaton wash, Encinita Street to Rio Hondo, temporary work, $25,000; Little Dalton wash, Grand Avenue to Citrus, concrete channel, $80,000; Los Angeles River, Union Pacific Bridge, etc., $250,000; Los Angeles River, riprap, Soto Street, $150,000 Other jobs (including emergency fund operation of dams, etc.) $350,000; San Gabriel dam Number One, $10,500,000; San Gabriel spreading grounds (exclusive of right-of-way) $146,000; Burbank wash, Victory Boulevard to Los Angeles River, $50,000.

E. Court Eaton, 202 North Broadway, Los Angeles, is the Chief Engineer of the Los Angeles County Flood Control District.

Los Angeles and Vicinity

By J. H. SACKETT

Plans have been made by H. A. Van Norman, Chief Engineer, Los Angeles Department of Water and Power, 207 South Broadway, Los Angeles, for the construction of **Bouquet Canyon Dam** and appurtenances as follow:

Dam—The dam will be of earth and rock fill, 185 feet high above streambed, creast width of 50-ft. and slopes of 3 to 1 on both sides, with a concrete cutoff wall and concrete facing, involving in the main: 2,500,000 cu. yd. of material.

Bids will be taken for the construction of the above dam, and compared with engineers estimate, which will then determine whether the dam will be constructed by contract or by the districts forces.

This FIRE-GUN *Quickly Smothers* FIRE!

and can be used on Electrical Equipment of HIGH VOLTAGE *without danger*

The FIRE-GUN delivers the entire liquid contents in a continuous stream of over twenty-five feet. The mechanism is protected by a strong shell. Rough usage will not damage working parts. FIRE-GUN Fluid does not damage machinery nor materials and has practically no wetting effect. There is no damage to switchboards; no coils to dry out, and nothing to clean up after its use.

Protect your excavating machines against Fire loss by installing FIRE-GUN extinguishers on all your equipment.

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Appurtenances—Involving supply line from San Franciscquito penstocks to Bouquet Canyon reservoir, consisting of 10,000 ft. of tunnel and 10,000 lin. ft. inverted steel siphon will be constructed by the Department of Water & Power by force account of day labor.

Total cost of project is—$5,000,000.

Although contract has already been approved by the Secretary of the Interior and the directors of the irrigation district for the construction of the **All-American Canal** or Boulder Canal which will involve the expenditure of $34,000,000.00, continued restraint against any further step toward consummating a contract for this canal has been made by Federal Judge Paul J. McCormick in San Diego.

The extension of the restraining order which has been in force since the suit was filed, will delay the last step in the approval or rejection of the contract, a vote upon it by the irrigation district voters will delay the immediate possibility of starting this large construction job.

BOOK REVIEWS

Technical descriptions of the methods of quarrying limestone and the detailed costs of the various operating steps at the Dallas and Fort Worth cement plants of the Trinity Portland Cement Company are given in two Information Circulars recently issued by the **United States Bureau of Mines,** Department of Commerce. **Circular 6498** covers the Dallas quarry while **Circular 6513** treats of the Fort Worth quarry. Both circulars are by J. W. Ganser.

The equipment and operating methods of the East Texas Gravel Company's semi-portable sand and gravel plant at Bois d'Arc, Texas, are described by Walter W. Hyde in **Information Circular 6537,** recently issued by the **United States Bureau of Mines,** Department of Commerce.

The methods used and the cost of quarrying, crushing and grinding limestone at the Catskill quarry of the North American Cement Corporation are described in **Information Circular 6522,** by W. J. Fullerton and A. W. Cox, recently published by the **United States Bureau of Mines,** Department of Commerce. This is one of a series of papers prepared for and published by the Bureau of Mines, describing methods and costs in cement plant quarries throughout the country.

The Motorizer, a new magazine published by **The Lincoln Electric Company,** P. O. Box 683, Cleveland, Ohio, makes its bow with the December 1931 issue. The publication will be devoted solely to the design, construction, operation, application and maintenance of alternating current, induction motors and their controls. Those interested in AC motors may obtain copies by addressing a request to the publishers.

Central and Truck Mixed Concrete, a committee study presented at the annual convention of the American Road Builders' Association at St. Louis is printed in booklet form (24 pages, 6 by 9 inches) in Bulletin No. 16. In the summary of conclusions the report says, "Ready mixed concrete with a production last year in excess of 7,000,000 cubic yards, is a method of construction which has come to stay." The bulletin is well illustrated and includes a report of the discussion held after the Chairman of the Committee, Col. R. Keith Compton, Director of Public Works, Richmond, Va., had presented his committe's work.

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1831 MORE THAN 100 YEARS of PROGRESS in WIRE MAKING 1932

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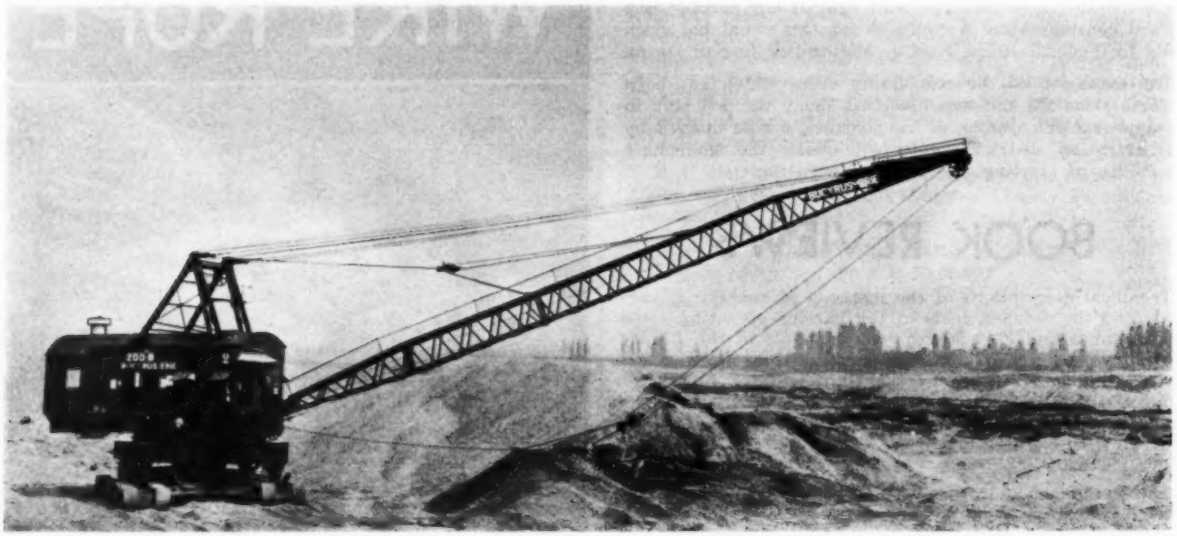
Huge Rhine Hydro-Electric Project Nears Completion

(Continued from Page 75)

a world's record on this type of work for a steam shovel of this size.

Included in the excavating plant was a large German "dryland dredge" of the chain-and-bucket



Two of these Class 200 Bucyrus-Erie electric draglines "rendered remarkable service" on the project. One excavated 1,500,000 cubic yards and averaged 215 yards an hour for total time including all delays.

type, carrying one-cubic yard capacity buckets. This machine, which has a weight of about 350 tons, rendered valuable services in the excavation for the generating station foundations and produced some remarkably high outputs.

Close-up of the movable hopper used in loading cars. When engines are switching in empties, the dragline can make a number of passes to fill the hopper while waiting for cars.

Big draglines load cars from deep excavation

The capacity of the Power Station will be 200,000 H.P. It will be equipped with two 120-ton overhead travelling cranes for handling the turbines, generators, etc. The excavation of the foundation of this big generating station necessitated going down to a depth of 80-feet. The material was all coarse sand and gravel, in some places cemented. One of the Bucyrus-Erie Class 200 draglines excavated this material and loaded it into trains through the medium of a 50-cubic-yard capacity hopper, straddling the loading track. The hopper weighed 12-tons and was very easily moved when necessary by the dragline itself. This is the method which will also be employed for excavating the final sections of dirt at the entrance and exit of the new canal from and to the existing course of the river. This soil will be lifted early next year, each section containing about 150,000 cubic yards, and the whole amount must be shifted in three months at the most, so that river traffic will be able to use the new canal by May 1st at the latest. The aid to navigation rendered by this new power canal and its immense locks, is one of the most important advantages of the whole scheme, since the new course cuts out the dangerous Istein Rapids, which have hitherto prevented the heavy barge traffic of the Rhine reaching Switzerland.

Mobility and utility of draglines praised

The owners of the two Class 200 caterpiller mounted electric draglines were particularly pleased with the adaptability and mobility of these huge excavators which enables them to be used with considerable economy on auxiliary constructional work, after the main excavation was finished. Contractors reading these notes will appreciate to the full the great value of having such long range and powerful machines as the Class 200 on hand for the speedy carrying out of this sort of work. The machines were further used as cranes for the erection and subsequent dismantling of the numerous large derricks and concrete distributors employed on the contract.

One of the locks included in the project is 83 feet wide by 610 feet long, which we understand is larger than even the Panama canal locks. The lock gates have a weight of 500 tons each. Pierre Moreau, son of the Chief Engineer, has been engineer in charge of the lock construction work.

This article would not be complete without mention of the little "model town" which has sprung

(Continued on Page 116)

HAISS EXCAVATOR

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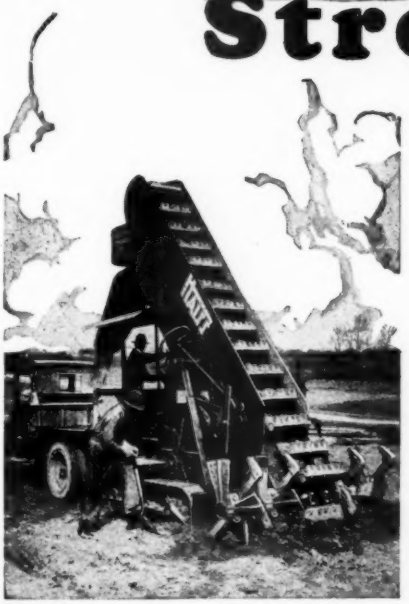
Street Grading



Putting a heavy excavation tool in to take out a 6-inch cut runs the cost 'way up. That was before the Haiss Excavator came along to demonstrate how easy it is to put light excavation on a profitable basis.

Now, 14 to 20c a yard, placed in the truck is a fair estimate of shallow grading cost, including 6 to 10c. a yard depreciation (both are too high) on the machine. These are not theoretical figures, but are averaged from costs reported on representative jobs in different localities.

You can make money with a Haiss Excavator. Get acquainted with the work it has done—see Bulletin 530.

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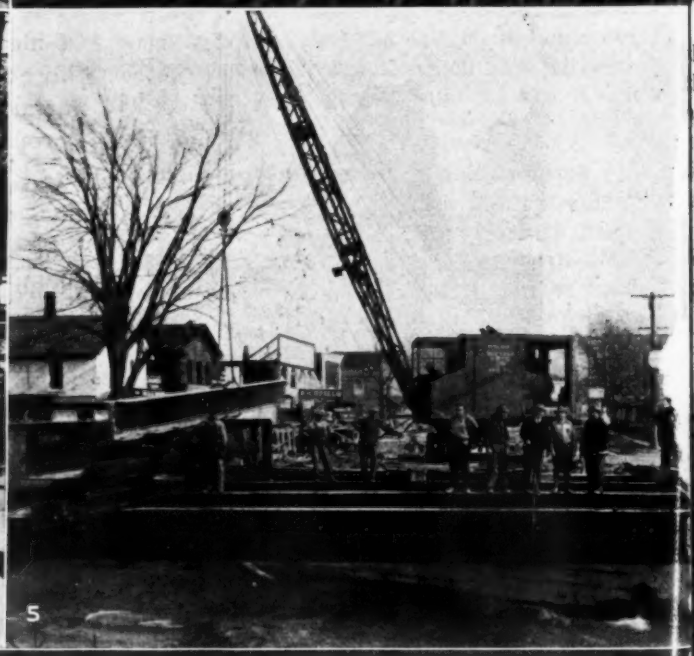

WINTER BRIDGE BUILDING

1. A motorist drove into the excavation for Bridge number 1 where a Bucyrus-Erie Type B steamer was driving piles. It was hard on the car, but there was no noticeable damage to the piling. The Bucyrus-Erie 1035 pulled out the car and turned it over to a garage wrecker. 2. Here is the concrete mixing plant on the East Randolph bridge. 3. Interior view of housing on bridge during winter operations. The temperature inside was 66 degrees while the temperature outside was 20 degrees. 4. Winter weather does not delay Mr. Knickenberg. Canvas coverings permitted satisfactory heating for pouring concrete on this bridge at East Randolph. 5. The five men standing in front of the 1035 are Messrs. Harrison; Gumtow; Herb Murphy, Superintendent; Walt O'Brien, Engineer in Charge; John Kirchoff, steel foreman.